FIGURE 1A

KCN6q gene: DNA sequence

1. Underlined nucleotides in capitals represent exons.
2. Initiating ATG codon in exon 1 and terminating TAA codon in exon 14 are shown in bold italics
3. D6D280 genetic marker and phosphoglycerate mutase pseudogene are bold underlined
4. The exact lengths of the gaps between exons 1 and 2, 2 and 3, 10 and 11, 11 and 12, 12 and 13, 13 and 14 are unknown; these gaps are presented as runs of ten **bold n** as a convenience only

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   1   CTGGAGTGAG GCGCGGGAAG ATGCCTGGTC CTTGCCTCGC GGACTTGGCA
  51   GCCGCGTCCT GCGGGTCTGT CCACTGAACT GCTGAGGACT GCGGCGGTGG
 101   CCTGAGGGAG AGCCGCCGGG GCAAGCAGGG GGCCCGGATG AGCCTGCTGG      Exon 1
 151   GGAAGCCGCT CTCTTACACG AGTAGCCAGA GCTGCCGGCG CAACGTCAAG
 201   TACCGGCGGG TGCAGAACTA CCTGTACAAC GTGCTGGAGA GACCCCGCGG
 251   CTGGGCGTTC ATCTACCACG CTTTCGTnnn nnnnnnnttc cttttctatt
 301   cttattatta atatatgatc ttattattaa taatataaag gaatagcaaa
 351   tgagaatcca tgagcaatat cagaccatga aaatgagcca gtggctgagt
 401   aacaaccaat taggacactt gatagtttag caaagttgcc aaacaggaga
 451   cagactcggc tcctttgaac gaagagtgac tgcagtgtgg attccccaga
 501   taggagagca agaacatact ttctgggcct ctctcaggat cgttgtttgg
 551   gaaggaagtt gtatgggaaa ttcacaaact cttagatgct aacatttaaa
 601   tgcagcatgc cacacacaca aacccacaaa cacaaccttt ttttcatcaa
 651   taaaattgca gaggagcccc atttgcacag tatatcacat tgtattttaa
 701   tatccaaaat ggctagtccc ttccagagtt tttatgagtt aatgtgtgct
 751   aatttaatgg gcctggtgct ttattcattt gaagcaagaa attaagtctg
 801   tgataataag gtaaggttct tatcagattt ctctttttgt tgtttttacag
 851   TTTTCTCCTT GTCTTTGGTT GCTTGATTTT GTCAGTGTTT TCTACCATCC      Exon 2
 901   CTGAGCACAC AAAATTGGCC TCAAGTTGCC TCTTGATCCT Ggtaagtgaa
 951   acatgaacaa gaacgtacat gaatgttgta taagaactgc ctataacatt
1001   tatactatgc atcttatcct acaaaaaaat cctatctaaa aaagagttac
1051   tgagaaatat aaaaatgtca aagattactg aaacatttgc ccaccaattt
1101   aacatgtagt caatccttag aaatatatag aaatgttcag gattgctatt
1151   acacagcaat atcttgtgtt gtagatatat cataaataga aggcaatatt
1201   agaaagcagt tttaagtatg tttatctatg ctaataaaca aattatataa
1251   gaagaatcag tatctatgag gcctctcatt atattgtgaa agactataga
1301   gtagagagca ttttccaata actgtaattt ggcagtagct aaatataatt
1351   ggccaagaac tatgaacata tggcacctca taagaaaata gaaggctcct
1401   tcatgctctt ttcaaccaac agactgcatt atgagttttg ctgctaatgc
1451   agttacctgg tgataaattc tgcagtttgc tctgtttcca ttatgctgtc
1501   aatcctcaac cacacagaat tgctcaattc actttnnnnn nnnnnacgag
1551   gtcaggaggt cgagaccatc ctgcctaaca cggtgaaacc ccgcctctac
1601   taaaaataca aaaaattagc tgggcgtagc tactcaggag gctgaggcag
1651   gagaatggcg tgaacctggg aggcggagct tgcagtgagc cgagattgcg
1701   tcactgcact ccagcgacag agccagactc cgtctcaaaa aaaaaaaaaa
1751   aaaaaaaaaa gagtatactt gatttatggc atgagtggtc ttgaatgatt
1801   ttgatggatg actggaaaca attagagata taaataaata gcacagaatc
1851   atgacagatt tcatgaagaa tacactgtga agattcacat ggttaataac
1901   attgaaatta ttaaaataaa agagactgca tatattagat ttttctttgt
1951   gatctagttg ttcaaagcag cagaaaactt taaattttcc ttaattttga
2001   aagtgtgatt aatggaatat tgttacaatg ccattgattt atatactttg
2051   aggatagtta acttctttat gtttattaga aattgcactg agagctaata
2101   tgcagtttct attggtggtg atatgttctg ttaacagggc ctcctgtcag
2151   ttttttattct gagatttctg cctttcctgt tcttttgcat gagcctaact
2201   gactgagttt caatatcaag ttctgaaagc aagtgagcat actagtgtgc
2251   atgcaatgtg cacagaaaga tgtgtttttcc tacctctcaa agctcaccaa
2301   aggatattac tcatattgcc acaaagtaca tttacaccaa taacacatac
2351   tttggtaatg ggaaaaataa ataatcttag gtaataaaat gcactttggt
2401   gcttataaag gaaaataatc atcacaggta gaagaggagg aaggcaagac
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FIGURE 1B

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2451  taggttttga ttcaaaatgt tttctgtttt gctaggaagt ctagaaggaa
2501  tttggtcaaa tgacctgagg aggcaaggag atttctccca gtggcacatg
2551  gcagtccaca agaagactag gggcagggaa acaaagcaag attgtatctg
2601  atttctacag gactccaaca ctaccctgcc aatacccttt tctcctctga
2651  aagccatgat cccaaaggtt tccatttctt ccgggttttt cacattctac
2701  caacaagcag aatgtcttcc ccactgacag ctcaacagtt gagtttttcg
2751  gggttctacc ccttcatcaa cacagccttt gctttcctgg ttactgagta
2801  aataaaacac actggccact tctgcttagc cttcaggagc cactctggct
2851  ccaccctgaa gttccatttc ctccaagaac taagacattt ggagattctg
2901  cctaaaatat gcttaaataa aagggataaa ctgtctctca ctttctttcc
2951  cccacagctt gtcttaagaa caacggtgta accattagtg aaaaatcctt
3001  tcaggctagt aaaatgtaaa aagagaagag gtatcgggta acaacaaatg
3051  aaaataaaat cattcagtgg tagaaaccat aggagtgaaa ttaggtagtt
3101  actgtcctcc agcttacatt aatcaaaata agcccacact gtcactaaga
3151  catcttgcag taagaagcca ttcaccctct cattgcaatt agtgtcataa
3201  agctgaatag acaggtcaga aatgaaaatc ataggccaat taagttattc
3251  tcatttttcc acctccagct agctcttttt gagaattttg attttaatag
3301  ataataaaac agtatgctaa ttgggtggtg ctgagcctga agccgtgaac
3351  tgaaggaaac ttcaacaaac atttggctag ggcctgctct aagcagaggg
3401  gctacgacaa tgggtaaggc atttctctag aaaccagcac tcagcagaat
3451  ttctggcacg agattttgtg agttttctag tggtgtgtct tatcttcccc
3501  caatagatta taaactcctc gagggtgaca gaacacattg ctgatcttta
3551  tatcctgcat gtttatggta ttcggtagac atttataaaa tgaattcatg
3601  aaaagcagaa catctagaaa tgaagtcaac attgcagaga agttagctat
3651  atgaaactct gtaaataccc tcaaggaaga aggaagaagc agattttctg
3701  gaaatcaagg gacctcccag tataagagca attcctttgg tccaagaag
3751  ggcagctata agaacagaga cataactcct ccgtaagaaa agataaaaat
3801  tctgaaagtt ctctaagaac atgcccagcc ctgacctgcc tctcactctc
3851  agtagcatgg aagccgtact atctcttatc ttgacacaag catccacttc
3901  aatccacagg acaaatatca ccaatatgag aagataagat ctgttttata
3951  gtcaacttgg ctgacatgta ctaatttctc aaggtcagga tagctctcta
4001  aatagaaata cttgtttgtt ttaaggaatt ttatttaaat ttgtgtatct
4051  taaattttaa ttttgatctc ggctcactgc aacctccacc tcccaggttc
4101  aagcaattct cctgcctcag cctcctgagt agctgggatt acaggcacct
4151  gtcaccatgc ctggccaatt tttgtatttt tagtagagac cggatttcac
4201  catgttaacc aggctggtct caaactcctg acctcaagtg atctgcttac
4251  caaggtctcc cagagtgctg agattacggg catgaaccac tgctcccagc
4301  ctcatgtagt tcttaagagg aagaaaagcc tatagattag tgagaagtag
4351  acaaattagc aatttgaatc aaatgaaaac ttggtttgat ttcattcatt
4401  ttggagacac tttcggtgtt tccattttga tctgattcag gacactgatc
4451  ttcgattcta agttgcactg gttaatttgt gattatttta caaaatcata
4501  acagaataca tatctgggtc cagttcaagg tacagcaagc cattttcaat
4551  gtttccagct tggtgtttat gattcataca tgaatcattt gggcatgcag
4601  acacacccaa atagaaacct caaaccaatt aaggtataaa taggtttagg
4651  atgggggagg atggacaaca aaaaaaacct cagtaaggct cctccacaaa
4701  gggcaccact tcagcttggt cccatgggca gacttcacct gtggcaggtg
4751  aaggggaaag cctaagacat cctgtgccct gatgcagatg tgacttacag
4801  aacataaaac gtaaaggcag aagggatcat ctgggtggct gctcatacta
4851  ggcaggcatt atagctgctg acaagagcca acccatccct aaggatctaa
4901  aatcactaca agagaggacg gaagtcctct catcatggca tcccaactag
4951  taactgggat gcatagggcc actccaggta ggcagcgagg ggtaaaccag
5001  gaatgtcctg ctgttcccac ctcttttccc caagcagggg gcacccactt
5051  cctgcctcca gcccatatgg tctcaattta tggcctcaat acctgataaa
5101  aaaccagccg tgatccttcc ttagtaacaa agtgtcaatc agtcatttgg
5151  aatggggcat tttcaaacta ttgcctccct atgatcttct gaagaacctc
5201  tgggataaat gaacattgtt atttaggtat ggttaaatga attacttttc
5251  aggagcagat ttatatatta acaggtgtga aaaacttgaa tggataaatc
5301  atttataaag aaatttcagg aatcaactaa tcccaagggg aaagacccac
5351  taagacacta gattttgctg gagctactca aacaaattca tctatcatat
5401  ctacctaagc cttccaatca atgagactag ccgcagtgac actgtctgtc
5451  aaaactacct cagtcatttt tttccaaggc aggaagcatc catacccctt
5501  cacaccttaa tctaatttcc cctatctcca ccccactccc acttctatga
5551  cccccttccc cccataccca cccccgaagc atctactagc caacttagtg
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FIGURE 1C

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5601   aagttctgtc acgctctcac aaccacctct gtgcagcaat gattctgtaa
5651   atatccatgt gtcctcaaca ccaggtcaaa ttagtccctt tggtaaaaac
5701   attcattccc tcaaattctc ttccaataca ctaatatacc ttcccaaaaa
5751   gtaaggagaa gcttgaaagc tagctggatt gatgatggta tgtgatgttc
5801   tataagttat agttagtaag catgttttta ggatattttt ctgctctcca
5851   aagagacaca attccggaag atatttactt ttgtgtattt ccacattttg
5901   gtttaagttt ggagccatct ctagatctta atttcattcc cctaatatgt
5951   gttatactag tagaattttc caaattacat agaattataa ctgcaactct
6001   tctgactgat gccttttttt tgcattttat gatgcagttt acatcacaaa
6051   ttctttccct gcagggatta tgtaaagagg catgttgacc tgctagccct
6101   atgttacttt aagtatatgc acacacacaa aaaggaacaa aaacagctgg
6151   gaattgatta tgttgatatt ctgaataaaa gcaatagttc taattatgta
6201   tgtctaatta gccacagctc ttcaagaatt gctgcaaatg tcacagggtt
6251   tataatgtcg gcatttcatc ttcacgaaaa tgctatttga tggcataaaa
6301   ccagaaaaaa ctaatggtca cagaagacag cttgtagatt agacaaaggt
6351   cactgtgttt taatgaacag tgctgttaat taatgagaaa acaactggta
6401   catgagcttt taagcattgt gaatttgtac ccaaaaaatc aatctgccta
6451   aaacaatttt aagtagctaa aaaacaaaat aacggcaaga acataattta
6501   aacctcaaat ggtacagcag agttatatgt atcaattaaa ttgaatcaca
6551   gttctcaggt gtgacatatg aagaggcttc tttaatgcct ggaaaagagg
6601   gttaatatgg attggtattc tcaatacata ttgtagataa aattcaagac
6651   tagctctacc actgcctctt ttcttttttt tttttttttt ttatttgaga
6701   cagtatctcg ctctgttgcc caagctggag tgcagtggca tgatctcggc
6751   tcactgcaag ctccgcctcc cgggttcacg ccattctcct gcctcagcct
6801   cctgagtagc tgggactaca ggcgcccgcc accacaccca gctaattttt
6851   tgtattttta gtagagacgg ggtttcacct tattagccag gatggtctcg
6901   atctcctgac ctcgtgaccc acccgcctcg gcttccgaaa gcgctgggat
6951   tacaggtgtg aaccaccgcg cccggccacc actgcctctt aggcttctta
7001   atttccttat catttaagaa gaataagaaa atgcttctat gttttaccaa
7051   aattctgtga ggacaaatga ggaaccattg taactcctac aaggtgagtg
7101   ataaaaataa tacacattta ttgtctttgc ttttgtaaag agttatccaa
7151   gccaagcttc taggggctta aataaggaag gacaggacca ttgttaataa
7201   catcaagttt ccactacagc tttcctccaa acaagtcaaa tattctgaat
7251   attattcact aatctcttta gctgccattt cagtaaatag cgagcatttt
7301   atttcaacta aaaccaagca agagaaaatg aactgcttta tcctgaggta
7351   cagcagcaaa ggcaccagaa cttgtctcat ggcttaccca gcaagggtca
7401   gaagaaccat ccctaattta aatcatctcg actgaatgta acagattttt
7451   gtattttcaa ctcatatgaa aataaaacaa tgagacctca tccaaagggt
7501   gatttagaga gtacctctaa acaaaacaca gtgaaaatag acccagcatc
7551   tggatttgaa gaacacattt cctcttacga gtctatccca ttgtctagat
7601   tgctggcaat ggcttttttta aatttaaatt gttattgaga taattgtaga
7651   ttcacatgca gttgtaagat atagtagaca taccctgtgt atactttacc
7701   caatttccgc aaaaggtaac attttgtaaa actatagtat aatatcacaa
7751   ccaggataat aatattgata cagctcacaa atctcattca gatttctcca
7801   gtttttacttg aatacatttg tgtgtgtgtg tgtgtgtgtg tgtgtgtgtg   D6S280
7851   tgtgtattgg ctctgtacag ttttatcact tgcagagatt agtatatcta
7901   aaacaacaat caagatattg gacagttccg gccgggcacg gtggctcact
7951   cctgtaatcc cagcactttg ggaggccgag gcaggcagat cacgaggtca
8001   ggagatcaag accatcctgg ctaacacggt gaaaccacgt ctctactaaa
8051   aatgcaaaaa attagctggg cgtggtggtg ggcgcctgta gtcccagcta
8101   ctcgggaggc tgaggcaggc gaatggcatt aaccagggag gtggagcttg
8151   cagtgagccg agatcgcacc actgcactcc attctgggca acagcgcgag
8201   actctgtctc aaaaaaaaaa aaaaaaaaa gatatcggac agttccattg
8251   tcacaaggat ctctcaagtt accccttgct aaccacatcc accttctcct
8301   tcacacttgc acacccttc ccttctccag cctgacccca gcagccacta
8351   atctgttctc catttctgaa atgttttat ttcaaaaatg ttatataaat
8401   ggaataatac agtgtataac tttttaagac tgacttttct tgcactcaat
8451   ataattccct ggcaattcat ttatgttact ctgtgtatca atagttcatt
8501   cattttatt attgagtagc attccatggt atggaggcac cagagcttgt
8551   ttaaccatcc tcatggtgaa ggacatctgg gctgttttttg gggtctggtc
8601   attatgaata cttcttctgt gaacattcat gtacaggttt ttgtacaaac
8651   ataagttttc atgtctctga cacgaatgcc caagagtaca attgctgagt
8701   catatggtaa ctatatgtcc agttttataa gaaacgacca tgctcagaag
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FIGURE 1D

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 8751   gaccatactg ttttacattc ccatcagcag tgtttgaatg atccagcttc
 8801   tccgcatcct ccccagcatt ttgtgttgtc actatttttt gccactattt
 8851   tttattttag ccattctgct agctgtgtag tgataccatt gcgatctaat
 8901   ttgcattttt ctgatggcta atgatgtcaa ataacttttc atgtgcttct
 8951   ttgccatatg tgtaacttct tttatgtatg tcctctttta tgaatatcct
 9001   atttatacct ttgccaattt tctaattgag tttttggttt tttactgttg
 9051   agttttaagg tttctttaca tattttagat attagtcctt tgtcagatat
 9101   gtggtttaca aacattttct cccagtctat ggcttgtctt ttcatcctta
 9151   gtacctgggc tctcacagag taagttttta cttttgatgg agtccaattt
 9201   ctcatttttt cctttataa cttctgcttt tgatgtcaag attaagaact
 9251   ctttgcttag tccaaatccc aaaaatatct ccattttttt cctaaaagtt
 9301   ttattatttt atgtttaatt tttaaacccg tggtccattt ttaaatgatt
 9351   atcataagat aggaagtata gattaaggtc cacttttttg cctatagatg
 9401   tccaattttt ccagcatcat ttgttgaggg cccttcttcc tccattgaaa
 9451   tgcttttgca cctttaaaac aaatcaattg agcatatttg tgtgggtcta
 9501   gttctgaatt ctctattctg ttcactgttc tatatgtctg tatgttccat
 9551   atgtctatcc ctccaccaat ccacagtctt gattactgga gctataatag
 9601   taggctttaa tatcaggtaa agtgattgat ctcgttttat tcttctttgt
 9651   cagcattgtt ttagctattc caggtcctgt gcatttccat ataaatttta
 9701   aaataagttt gtatctaccc cccaaaaaaa actttgctga gattttgaca
 9751   ggaattttat tagacctgta gatcaatttg ggaagaattg acatctttgc
 9801   tatgatcagt cttccaattc ataaacacgg tatttctcct cacttatttta
 9851   ggtcttttct gatttctttt atctgcattt cataatctca atgcacataa
 9901   accgtatgtg ttttctaag tggatattta agttattttt atttggaatt
 9951   attataaata ataattttgt gtttctaatt ttcatttcca catgatcatt
10001   gttagtataa agaaatatga ttaattttta tattgatcat acatcgtgca
10051   gccttagtga actcacttgt ttcaagagtg tcttcgtaga tttcttggga
10101   tttttctgta gaccatcatg ccatttgtaa atagagacca ttttatgttt
10151   acctttccaa actgcatggt ttttttttctt ttatttggct tattgcagca
10201   actattaata taacttacaa tactatgttg aataagagtg atgaaagtat
10251   acatcttggt tgttcttaat gttggggaaa agcattcagt ctttcactat
10301   taagtatgat gttaagtttg ttgtaaatgc tatttatcga attaaactgt
10351   taaacctctt ttcctaactt gccaagagtt ttttttaatc ataaatgggt
10401   gttggatttt gtcaaatgct atttcgtcat caatttatgt gattttttttt
10451   tagctttatt atataatgca ttatattgat tgatttcaac cattgagcta
10501   gccttgcata cctggaataa atcctacttg cctatatatt gactgattga
10551   ctgtttgcta atattttgct gaggattttt tgtgtctaag tttatgataa
10601   atatgggtat gtagtttttg ttttgctttg ttttattgtc tttgtctggt
10651   tttggtgtca ggataatact gacttcataa aatcattgag aaagttttttt
10701   ctcctctatt ttctgggaga aattgtgtga aaatgatata ttcttattta
10751   aatgtctggt tgattttgcc agtgaaacca tttgacctgg acatttctgt
10801   ttggggagat tttaaactat gagttcaatt gctttagcgg ttatagggct
10851   acctagattg tctatttctt ctttgttgag ttttggtagc ttgtagtttt
10901   aaaggatttg gtccatttct tctaagttat caagtgtatg tgcgtaaagt
10951   taccatagta ctccttcatt ttttcagtgg cgtagaatct atactgatat
11001   cccctattac attcctgaca ttggggattt tcatcagctt tcaagaaaga
11051   gatttatcaa ctttattgat tttctcaagg aaccactttt ttgtttcatg
11101   gattttccat attgttttcc tcttttcagt ttcattaatt tttgctcttt
11151   tctatgttat ttccttctat ctgcttcctt tgggtttatt ttacccttct
11201   ttttccaatt tcttgaggta ggtactcaga ttattaatat gagaactttc
11251   ttcatctaca atgtaagcat ttagtgctat aaattttcct ctcagcactg
11301   cttttactgc atcctacata ttttgttatg tcattttttt attttcattc
11351   agttcaattt ttttaaaatt tttgagactt tctctttgac caatggacta
11401   ctgggaatat tgtttaattt ccacatgttt agagatttgc ttgttgtctt
11451   tctgttattg atttctagtt ttattccatt gtggcttgag aacacattct
11501   gtctgatttt attcttttaa acttgttgaa atttgtttat gacccggaat
11551   ataatctatc ttaataaatg tgcatgggtg cttttttaaaa atgtgtattc
11601   tgctgatgtt gggtgaaatg tctcatatca gtcagatcct gcaggttgaa
11651   tgtgttgttc aaatagttca catacttgtt aatttttcatt ctagtagtgc
11701   tatgcccata gttctgagca aggataaggt gggttgatga agttcccaaa
11751   tacgacttaa catttgtcta ttttttccttt cagccctatt ggttttgctt
11801   tatgaatttt gagactgtct tgtcattttc ccctcacctt cttaaaaaaa
11851   aaagcagcaa gcaatatttc tgaacaatag ggcttgaata aagaacttgt
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FIGURE 1E

```
11901  aaatgtactt  tatcctgcct  tactgcagca  gaggaatagt  gcagtgacct
11951  tggcatacct  aagaacaatg  ggcatatatc  tgtcatttgt  taagaacaat
12001  ggacatattg  gtgtcatctg  tttccatgaa  aaagaaaaat  tactacacag
12051  tagtgttcgg  gggctcaggc  cacatttggg  attttcttgg  gatcccttat
12101  aatatgagta  ctcacaactg  gagtgccaaa  tgtcctggca  taagcaggaa
12151  ttaggggcag  ggattaaaaa  gtggatctgc  cattcaacct  aggttgggca
12201  caggcacaac  tacatgggca  ttttgggcct  gagtatgttt  tccatatttg
12251  gaaagatgtg  ctggattaac  aagaaatgat  ctggcacttt  agatacctta
12301  ataaatgaac  agactcaact  acccagatat  acattcaaaa  ccaaaacaaa
12351  gccaaaatca  aacaaaacct  tcggattatt  aatgaatgta  tgttgaccct
12401  aattttggtt  atctgtgcat  aaagtcatct  ttgaaggttt  atcctataag
12451  taattttgaa  taactgtgag  taagcagtga  tgatattggg  tatttatttc
12501  ccatcatgag  aaatatttgt  ggattactta  gtgcaaaata  agagaaggat
12551  agaatgatat  agctctacta  ggcatttcaa  aagtgcagca  tatcatcaca
12601  tgctctaatt  aaagaaacag  acatttgcct  gaaatttgca  acaaaaatgc
12651  cacttttata  aatttggtaa  cagttttat   cctgcgagta  agaatgggag
12701  aatggggagt  aggttagaat  gtttactttc  tctgctttgt  atttctgtga
12751  tgtttggaag  ttttaataaa  gacaatatat  tactttaca   attaagctat
12801  tataacaaca  atctataaat  attgttctac  attataaatc  ttgaatcaac
12851  cctcgtttta  aaacaagaaa  gtgaattatt  ttttaaagga  aaaacaattt
12901  tgataaataa  agtgcctgtc  cctatagaga  cagcaaggtg  actgtgctaa
12951  gcttgctcca  gaaatgcttt  cgttttacaa  attccatttg  gtttttcatt
13001  ctatcatcga  ctgtttaatg  agccactcta  gctggccttt  ccccagggtt
13051  aactcacaac  tcttcctaaa  taatctcagt  cattttcctg  gagcaggtgt
13101  tgttttctag  gcagctcttg  ccaaagggca  gcataataat  taacaagctt
13151  cagatctgga  ggattcaggg  tctcatttct  ggcaaaggat  atgtgtgtca
13201  cactgtaatg  cttttgaaac  ttactgtttt  ataaggagat  tttgacactg
13251  taacgaaaga  attcagtata  cttcgaaata  tttgcttctt  tttctctaag
13301  aacaactctc  gaagatttag  agattatgtc  actccttgca  gcaaaatgaa
13351  gctctatttt  ctgtaaaact  tgccattata  tttcaggatc  gctattttat
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13451  ttccagacga  gacagatcca  ttattcagcc  tgcacattta  gtattgaaac
13501  tgactcccaa  atttacgaag  cattaatgac  ttgaaaagga  atagcattcc
13551  atgataggaa  atgcagacag  tatgaggttc  aaatgctgtc  cagatttagt
13601  ttgatctgga  gaaaggaaat  gttcttaact  ttagatatta  acaactagat
13651  cctttagaca  aagtgcctaa  atgtccaaaa  atatgcatag  agcttcttac
13701  tgtggtttgc  tccataatgc  ttctctctga  tatgtcttat  ctgatatttt
13751  agGAGTTCGT  GATGATTGTC  GTCTTTGGTT  TGGAGTTCAT  CATTCGAATC
13801  TGGTCTGCGG  GTTGCTGTTG  TCGATATAGA  GGATGGCAAG  GAAGACTGAG
13851  GTTTGCTCGA  AAGCCCTTCT  GTGTTATAGg  tgaatatcag  agtctcagat
13901  acctggacta  tgacaccaac  attcttgtct  tctatctcct  gttttgcaat
13951  atttgattaa  tattaaaagc  taacatccat  ggagtactta  tcatggaccg
14001  ggcactcttg  tgtcttgaaa  atgttgactc  atttgatgtt  gtctccacag
14051  cattatgagg  tagatatttt  tattatcccc  attttacagt  tgaagaattt
14101  gagacaaaga  gagacggagt  tagttgctga  atgtcataca  gctactaagt
14151  ggtagagctt  gaatttttagc caggcaatct  ggctctagaa  tacccactta
14201  tatcaattaa  cttatatgga  aatacatgtt  tctccagtgt  tgccctaatt
14251  taggggaaca  ttgatttcag  tgagtataaa  aaaccctttt  tgctctacaa
14301  tatgacacca  gtttatgctc  tggatcagct  ggaatagata  gccatacatt
14351  ggtactggta  atgcatatca  attaacattc  ttcaagaatg  attataagta
14401  tggtttgctt  aatgcattgg  taactgtaga  ctggacaaag  tgctctacac
14451  tctgaaatat  gaatccccca  ccctccaatc  caaaataccc  aaatacatag
14501  cacatctctg  cacctcccta  gctgccattg  tttctgagag  acatcattca
14551  cctgggttct  agcttgaaat  tgtacttcct  aatgaagatg  ccatagagca
14601  ttctggaatt  aagatctagc  atttcccagt  aatatttaaa  agtattataa
14651  aatggaaaag  tctatatata  aaagctatta  ttattattat  ttagtagcta
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14751  aaatccaaat  actgaaaatt  cttgatgagg  cttatttatt  tcaactattt
14801  tcaacctgaa  aaagtaggt   tttaatttac  aaaatagttt  aggctatctt
14851  ctacagctac  cacaggtttt  ctgtttgtt   ttaggagtca  ggaattgttg
14901  cgtaatcttc  tcagtttcct  cccttactcc  tgttccctat  ggtgggggca
14951  gagtggattt  aaggaagaaa  gtgtatcacc  atccatgggc  actgttaaga
15001  agaatccttt  attccatact  tctttcatag  tatgcacatc  tcaaaagtct
```

Exon 3(D)

```
15051   ccacttatta  aaccagaatt  tatggaaatg  tggctgtgtg  tgaggcactg
15101   gtgttacaat  agtgaatcta  gtggaattct  cagttaaatc  tatcttaaaa
15151   taccttgttt  ggccctcacg  aatgcagtct  gtttgtctgt  cttctccaat
15201   aataggcttt  actgcttttt  ggaagccatc  atgctaaggt  atggagcaaa
15251   gtcggtggta  actccaagcc  ttgcaggttc  ataaagcccc  aaggcatatt
15301   agtgaaggca  ttagattttt  ctccctggag  atgctttttt  ctctctgaat
15351   tctctactca  ggcagcatta  caaaggactg  taacctgatg  tgaaactact
15401   gcacaacaag  tactttctgt  cccataaggg  gcccaaacaa  aacaattcac
15451   aaggcagatg  gttagccaag  attcactcaa  cttctacagg  ataaggtcag
15501   ttcatggatg  actggaaaaa  tgtttcattc  cagattttaa  aaccaattaa
15551   aaattggttt  tgttccaatt  tcagaagcaa  tgccaatgta  tctctggcct
15601   ccatgcgaaa  aagaaagctt  tttcccagat  gtctgctgcc  ttttgatagc
15651   tgttttcagc  tacggataca  tcaacacatc  ttagtccttt  agtctttctc
15701   ttcctgcctc  agatccttgc  aggtcttgat  ataatatgta  gttctaaaaa
15751   tgatgttatg  ttatctataa  tcttacttgc  ctttggatgt  atcaatagtg
15801   accttaaaaa  tttagtatga  tgcctggcgc  agtcactcct  gcctgtaatc
15851   ccagcccttt  ggaaggctga  ggaaggcaga  tcacttgagc  ccaggagttt
15901   aagaccagcc  tgggatggaa  agacctgtct  ctacaaaaat  ttaaaaatta
15951   gctgggcatg  gtggcataca  cctgtagtcc  cagctactca  gaaggctgag
16001   actggaggat  catttgagcc  caggagtttg  aggctgcagt  gagccatgtt
16051   cctgccacta  cactccagcc  tgagtaaaaa  gagtaagacc  ctgtctcaaa
16101   aaaatactag  tatgacatgg  tttacgcata  attgcagttt  tgttaaccct
16151   tcagaccttt  tctttattta  gatattttac  ctctaggaaa  ttaattgctt
16201   tggaagaaaa  tttcatggat  aaatatataa  tgaatcccca  ttagaacaaa
16251   gtctagattt  gtacttacag  ttaggataat  tatgaatttt  ttagtctttt
16301   attaaatgta  catgtttgac  ccatggtcca  gctgaatgga  tgttatagtg
16351   aagcatgttc  aaatgtggct  tatcagtatg  aggtcagtaa  aatttaacct
16401   acacaaagga  atcaaacatc  accttcctga  aggcagcaag  ctgtaccaga
16451   tgactgttga  gactatttct  aggcccgttc  aacaggttca  taaaaacgct
16501   tgatgtaact  ggtaaaatac  taaagtgaac  actgtagtcg  ccttgttcaa
16551   cctaatttac  tgtgacaaaa  tgaaaaaaga  aatagcatct  cttatctgtc
16601   cctgataact  gttctgaatg  ggtgtttgga  aatatagcta  aaacctccca
16651   aaacttcatg  tatttgtaag  atttgattac  tctgaacatt  ccaagtacac
16701   acccaaatat  ttttagaagt  gttgagcatt  cgagaaaaga  acatagaaaa
16751   gattgtggta  gactggctgt  gccttcaacc  tgggaaatgc  tttctgtaag
16801   cacaccaatg  ttttctcttc  cagttggaaa  tacactgaag  ctgctagagt
16851   ggtcagctaa  caagccccat  gtactattgc  accctattga  caaaggccca
16901   attgatagag  gttttatggg  ctaattactg  aaggtttttag  catgtccct
16951   tctgaactgc  ccaccttcct  tacccctgca  ctctagccaa  aaccaagagc
17001   atttcaaaag  cccactgatc  tcacaaatcc  taaaatcatt  acatatttgt
17051   gtttggaaaa  catattttaa  acaattataa  cataagggaa  gaaataaatc
17101   tatttaactt  tttttaatta  ggtactttgt  ttcattacta  ctgtacattg
17151   atgtatgtct  gcttggtttt  aagcatttgc  tttgaaaatt  agtaaaatct
17201   tatctagaac  ataaaattct  tcctcatatc  tatgtgttca  atttttatct
17251   ctcccctaag  actcttctgt  cataataaca  ttctatagct  atgagcacta
17301   attgctgtat  tgctgatgtg  gatagtcaag  tgtgttttgg  gatgaccacc
17351   caagctgccc  ttcatttacc  cagactggct  gctttatgat  ttctctatgt
17401   gaaaacacaa  aacactcacc  caataacatc  ggcataaaga  atttgtgaat
17451   aacctctaag  actgatttca  tagtcattct  tttttctagc  tttcattact
17501   gacctaccca  aaaattgcaa  atagacctaa  ggctgaaact  tggatcacaa
17551   taatgagcct  gatgtgtcag  gaagccaaca  aattacttct  cacagtggct
17601   tttttttagat  tccttggtga  cgctttccaa  aggcagatat  aacagggcca
17651   tatttttcag  tcttgcaggg  agtctcagtg  agaaaatacc  agcctgttgt
17701   tagtcttgga  tctgcatttg  atgctaagtg  taagttgatt  tcttattgtt
17751   attttaacag  tttatttttca  gtgtaattat  ttccacaaga  ggacaaaaga
17801   ggaataaaat  aaaatttttat  tttatcctac  gtggataaaa  taaaattgaa
17851   gcctttatta  aaatcgacca  catggctgag  actactctaa  tatatctatg
17901   atttcatctt  attaaaaggc  aacttaagtt  gctaatgtgt  tcaaaagtta
17951   gatcagactc  ccaaaactgc  cactgtgttc  taaattgatt  ttgagacatc
18001   attttttctgt  ttctctgtct  tctctatctt  ttgttctaag  agacttactc
18051   ttcaatggca  ttattttcta  taccttctac  tcccttttcc  ctttagtaga
18101   aattatatta  tttcacttat  tttctgttag  tcatacactc  ttctgcaact
18151   tattacttct  aagtgttcaa  actccctcag  tgcatgtaga  ttccttccat
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18201   gtgattaact ggaccatctg aggacaatta aaacctgttg gattggctga
18251   tcacaaaaca ttaaaacaat tttaatccct ctagttagta atagctgata
18301   tttattgaga actactatat attaggtact actttaagca ctttataaat
18351   atggtcttat ttaattctac ataagtacta taatgtcctt atttattta
18401   ttttatttta ctttacttta ttttattcta ttttatttta ttttatttta
18451   ttttatttta ttttatttta ttttatttta tttttgagg cagagtttcc
18501   ctctatcacc caggctggag tccaaatggc atagtctcag ctcactacaa
18551   cctccgcctc ctgggttcaa gccattctca tgcctcagcc tcccgagtag
18601   ctgggactac aggcacacgc caccacaccc agctaatttt tgcattttta
18651   gtagagatag gatttcaccg tgttggccag gctggtcttg aactcctggc
18701   ctcaagtaat ccacccgcct cagcgtccca aagtgctggt attacaagtg
18751   tgagccacca cgcctggcct ttataatgtc ccattttata gatgaggaag
18801   taagacaaga ctgaagactt tatagatgag gaagcaagac aaacttaaaa
18851   agatgatagg tgaaagaacc tggatttatt tctcatgatt tcactctaga
18901   aaaatataca tacccaactg gaaaattgtc tttactgttt attagcattt
18951   taaaattaaa tttaattgaa ccttatctat tgtcatcaac ttgtaaacag
19001   aagaacatga tactattatg cttatcatta gtaattcaag atctttaaag
19051   aaaagccagg ctttatagaa cattaattgc agtatcagcc ttaattatat
19101   caactaaatt atgttaccta ttgctgctct ctaacctgaa tgggaaatta
19151   ggacctaaaa tagacttact tacctgtatc aaacttgcat atactcttca
19201   gttgttgtta tcatgaggct ccctgtgtat ttccaaattg gagacctctg
19251   gagagcaagt aacattactc gcaggactac cttcaaatgt tttttaacat
19301   taataaacta tcggtaattt agataattgt tgacctggta cacaaacttg
19351   aaagttgaac ttacaagaca gcttgattag ctgatatggt tggaccacat
19401   gaagaaaatt tatttccgaa gaggaaaatg aataaggatt atttcccact
19451   ctttctataa actttagtag agcactatga tatactgtat taacattctg
19501   tactatcaca tgttacataa gaaaattcat tcacagacag ggtatttatt
19551   atgtgtcaaa cataatctta agtataaagg atacaaaagc gactaaaaca
19601   cggtccctgc ctgtaagaat agaatctcct gtgcccttag agaatggcaa
19651   aacttaaagg aggtatacta taattatggt gttacagagc aaaggtgatg
19701   gaaattgaag tagtcctaga aagaaggcta tggaatatca tgagtgattg
19751   tataaaacaa agaagcaaag gactacccc aggttttcaa attatgtttg
19801   agtcatccac tgaacattta tacaatttct accatgtcca agcatgctta
19851   tggatgctgg agaggctgta tggcaccaaa tgggcaaggt cttccttctt
19901   atagagataa tattcgtgtg gacaaagaaa aacaatacac aaatatgttt
19951   ttgaaaaaca agataatgtc atctacagat aagcacaatg aagaaaataa
20001   aacagaaaga gtagaggcta ccttagcttg ggtggtctga gaaagtcttt
20051   ctaagtagtt gacacttgag ttgacctgaa tattaagaag aagccagcca
20101   tgaggaggtt tagacacaga tctttccagg ccagggaata gtaattgcaa
20151   ggattattaa cacttgatga gcttgggttg tacaaggtgg agacataagg
20201   tctcgtggct ggagctcaat gagcagtggg gagaatagca gaaggtgata
20251   ggggagacag gcagaggtca caccctgaag gccatgtagg ctctgctacc
20301   ctgaatcaag gttccttcta aagacaggcc accaggcaaa ggtcctacgg
20351   gttgctggca ggcctaatat gaatactatt caggttatga acagcagcat
20401   taatcaggca acaaaaagta tggctgttta atgccctggg ttttttagtc
20451   atgtatgcct gttggaactt catatcagca atatacaaat tattacccat
20501   ttatgtttat aaaaaacata aacataagtt tataaggaaa taatcctctg
20551   aattttgttt ctatatttct gcccttagaa acatgaaatt ttacattgtt
20601   ttttaaaatg ttattttttct atgaggaact ggaattagaa tgtgatggaa
20651   acttttttac agccccagtg gtatcaccag taagcagttc ctaagatcct
20701   ccttgccaag ggactctatt ccatactctt agttatgatg attgcagtgc
20751   agaattattt cattaaagat tgtttatttc ttttgagaaa ttgtcccttt
20801   ttgccttgag atgttatctg aaactgtatg atcaataaga agcattaaac
20851   tgtcactatg gggtaaattt tcaaagtggt gcctgcaatt tgccagtatg
20901   agtcccatta acttctgtgg aagtcctgca gttaaacccc tgcacatggc
20951   tttgaaaatg ttctacaagt ttgtctttgt ggtgcctttt ttatttttaa
21001   taaatatcac agagcaactc agtgcatagt tgattgcagt atttaagaac
21051   gtggataatg tactgtgcag gaggagactt ttaaaattag attttaaagc
21101   ttcatttcta ttaagagtca caacaacaat ataaatacat ctttagttct
21151   tcaaagagca cctttctata aaggaatttg gagctcaatt agaatataga
21201   gcttataaag cagcaccatg tccctctgag acattgttta cttcactcta
21251   tagatggaaa agtcgaggca ctgtgaagtg ggggtgcttt gtccttagcc
21301   cataaatcag cagtaaagct aggaatagca tgctggcctc ccaatagctc
```

FIGURE 1H

```
21351    attgctctaa agcactgcct cttgttagag tcaaatttaa ttatagtata
21401    atccgtttaa tctacatgtg gagaaataat gaaggagcag gaaaaatgaa
21451    tttcttaaca gatcagtgga aaaccatatt acatagatta gcaactgtct
21501    tttcaagatc cgtattttcg gcatgtacta gatggtatct gatgccatga
21551    aagcaaatat tctaattcca ctggccagaa ctggcaaaga acttcttatt
21601    ttcctcactt tgaaacataa gtaaaggggt tccacttgaa aattaataag
21651    ccatgtgata tgattcgatt cctgtcccca aatctccctc cttctagggg
21701    ccattgtcta aagtctaaaa gaaaacatac caggcacagt ggctcatgcc
21751    tgtaatccca gcactttaaa gggagagcaa ggtaggagga tcacttgagc
21801    ctaggagttc aaaatcatca acctgggcaa cataatgaga ccctatctct
21851    acaaaaaaaa caaacaaaaa caaaaacaaa caaaaaaaac tgtaatagct
21901    gggtgtggtg gaacacactg gtagtctcag ctactcagga ggctgatagg
21951    agaaggtaac ttctgcccag gaattcaagg ctgcagtgaa ttatgattgc
22001    accactgtac tgcagcctgg gcaacagagt aagacagaga gagagagaga
22051    caaagagaaa ggaaggaagg aaagaaggaa ggagggaagg aaggaaggaa
22101    ggaaggaagg aaggaaggaa ggaaggaagg aaggaaggaa gggaagaagg
22151    aaggaaggga gggagggaag gagggaggga aagaaggaa aggaaagaaa
22201    ataaatgtaa ctattataaa agatgttcaa tgtttattt tggaataact
22251    ttagacttac ttagaagttg caaaaatagt acagaatttc catgttcaaa
22301    tgtactcttt acctaacttt ccccaaaata ttttacctac gtatactgca
22351    attatcaaaa ccaggatatg aatacatact attagctata gtctttattt
22401    gaatttcacc agttttaca tgcgctcaat ttttatatac actcctataa
22451    aattttctca catgtatata tgcatttaac caccaccaca atcaaaatac
22501    aaaacttttc catcacccta aataaacttg gaatgatata ctttgtatta
22551    ttcctttaca ggtactccct ctcttcaatc ctaacctctg ggaaccacta
22601    tatctgttct gtttcactgt aattttgtca tttttataat gttatataaa
22651    tgaaattgta aagtagtaat cttttgaaat tggcttttc ttacacagca
22701    tgatgctctt gagatccatc caagtgcatc aatagtgcat tcctgtttat
22751    tgcttaatag aattccatga tctagatgta acacaatttg tatattcatt
22801    tacctaatca aggtcatttg ggctgcttct agttttggc tattacaaat
22851    aaggcagcta tgtacattca tgtgtaggtt tgtgtatgaa cgtaagtttt
22901    tatttctcta gggtcatata gtgctagttc acctttatca gaaactgcca
22951    aactatttcc ttttaaaata tagaaatgcc aatgcaaaca tgtgcatgga
23001    ggtcagcagc cccacccct gccccacgct gccactgctg ccagtgtgaa
23051    catatgcatg gaggctggca gccccacgct caccactagc ctgcccctgc
23101    actgacactg ctaccagcat gagcgtgcac atggaggccg gcagccccat
23151    ggccaccagc actctgcccc agttgatgag cattcacccc accacactgc
23201    cacttgctct tggcactgct cttggcactt acaaatgagc acagatcctg
23251    ctgccaccac cccaacaaag tggtttggct ggcaccaccc atcagagtat
23301    tgtggccaga ggtgcaggaa caccttagcg cctccacttt agcagtttcc
23351    taacctcaag gggccagaga ataaagtcag agatccagta acagcctccc
23401    aaagttgcag catacagccc aaaagttctg agctgagcct tacccctaa
23451    attcttccag aaatgaagcc agtcaactga acccacctta tatgagattc
23501    aaaccttcca gggcatcaaa gaagatagag gcaaaaaaaa aaaaaaaaaa
23551    aaaaaaacta tccaaaggac agcaatttca aagactgaag gaaaatcagc
23601    ccacacagat gataaagaac cagtgcaaga gctctggcaa ctcaaaagtc
23651    agagtgcttt cttacctcca aacaactgca gtagttcccc agcaatggtt
23701    cttaaccagg ctgaaatgac aaaaagagaa atcagaatgt ggataggaac
23751    agagatcact gagattcagg agacagtgaa aacctaatcc agggattcta
23801    aggattacaa caaagtgata caggagatga aagacgaaat ggccacttta
23851    agaaagaaca gaactgatct gatagagctg aaaaactcac ttcaagaatt
23901    ccagaataca atcacaaata taacggcaga atcgatcaag ctgaggaaag
23951    aatctcagag cttgaatatc gcttctctga ataactcag tcagacaaaa
24001    ataaagaaaa aaagattaaa gaagaatgaa caaaatctcc aaagtatggg
24051    attatgtaaa gacaccaaat ctatgactca ctgatgtccc tgaaagagag
24101    ggagagaaag caagcaactt ggagaacata tttcaggata tcatccatga
24151    aaattccccc aacttcacta gagaggccaa cattcaaatt gagaaaatgc
24201    agagaaccct tgtgagatac tatacagata accatcccca agacacatac
24251    ttgtcagatt ctctaaggtc aaaacaaaac aaaaaatgtt aacagcagct
24301    aaagagaagg ggcaggccac ctcccaagga aaccccatca ggctaacagc
24351    acacctttca gcagaaactc tataagccag cagagattga ggacctatat
24401    tcagcattat taaagaaaag aaattccaaa caagaatttc atatccagcc
24451    aaactaagct tcataaatga aggagaaata agattctttt caggcgagca
```

FIGURE 1I

```
24501  aatgctaagg gaattcatta ccatcagacc tgccttataa gaggtcctaa
24551  agagagtgtt aaatatggaa aggaaagatt attactggca actacaaaaa
24601  cgtgcttaag tacacacacc attgatgcca aaaagcaacc acacaaacag
24651  atctgcataa taaccaatta acaacacaaa acaggatttg atccttcaaa
24701  tccacacata tcaatattaa ccttaaatgt aaatgggcta aatgcccaat
24751  taaaaggcac agagtggcaa gttggacaaa gaagcaagac ccaacagtat
24801  gctgtcttga atagacccat ttcacatgca gtgacgcaca taggatcaaa
24851  ctaaagggat ggagaaaaat ctaccaagca aatggaaaac agaaaaaagc
24901  aggagttgct attctacatt caaacaaaac agactttaaa ccaacaaaaa
24951  tcaaaaaaga taaagaaagg cattacataa tggtaaaggg ttcacctcaa
25001  aaggccagac ttaactatcc taaatagata tgcatccaaa acaggagcac
25051  ccaaattcat agagcaagtt tttagacacc cacaaagaga tttagataac
25101  cacacaataa tagtgggaga ctttaacatc ccactggcag tattagacag
25151  gtcattgagg cagaaaacta acaaagaaat tcaggacctg aatttgacac
25201  ttgactaaat agacctaata gacatctaca gaaatctcca cccaaaaaca
25251  ggagtgtata tattcttctc atctgcacat ggcccataat ctaaaattga
25301  ctaatcagcc ataaaacaat ccttagcaaa taaaaaaaaa tcataccaac
25351  cacactctca gactacagtg caataaaaat agaaattaat ggaaattaac
25401  ctgcttctga atgactttg ggtaaacaat gaaattaagg tagaaattca
25451  gaaattattt gaaactaatt agaacaaaga tactacatac cagaatctct
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25551  tacatcaaa. agttagaaag atcttaagtt aacaaccgaa catcacacct
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25651  aagaaatcaa aatctgcact aaactgaagg aaattgagac gcaaaaaaac
25701  atacagaaga tcaatgaatc caggacttgg ttcttcgaaa gaataaataa
25751  gatagataaa atgctagcta gactaataag gaaaaaaaga gagatcaaaa
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25851  tttaaaaaac cctcagagac tactaaaaac acctctatgc acacaaacta
25901  gaaaacctag aagaaatgga taaattcctt gaaacataca accttccaag
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26051  agagggattc acagctgaat attacaagaa gtataaagaa gagctggtac
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26651  tcctggccag agcaatcagg caagagaaag atataaaagc catctgaata
26701  gaggggaagt caaactgtcc ctgattccag tcagtatgat tctatgccca
26751  gaaaacccca taatctctgc tccaaagctc cttggtttga taaacaactt
26801  cagcaaagct tcaggataca aagtcaatgt acaaaaatca gtagaatccc
26851  tgtgcaccaa caacatccaa gctgagagcc aaatcaagaa tgctatcccc
26901  caagcctgcc acc̲a̲t̲g̲g̲c̲c̲a̲ c̲c̲t̲a̲c̲a̲a̲a̲c̲t̲ g̲g̲t̲g̲c̲a̲g̲a̲t̲c̲ c̲a̲g̲c̲a̲c̲a̲g̲c̲g̲
26951  a̲g̲a̲g̲t̲g̲a̲g̲t̲g̲ g̲a̲a̲c̲c̲t̲g̲g̲a̲g̲ a̲a̲c̲c̲a̲c̲t̲t̲c̲a̲ g̲c̲g̲g̲c̲t̲g̲g̲t̲a̲ c̲g̲a̲c̲g̲c̲c̲a̲t̲c̲
27001  c̲t̲g̲a̲g̲c̲c̲c̲a̲g̲ c̲g̲g̲g̲c̲c̲a̲t̲g̲a̲ g̲g̲c̲g̲g̲c̲a̲a̲a̲g̲ c̲a̲g̲g̲c̲a̲c̲t̲g̲c̲ g̲a̲g̲a̲t̲g̲c̲t̲g̲g̲
27051  c̲t̲a̲t̲g̲a̲g̲t̲t̲t̲ g̲a̲c̲a̲t̲c̲t̲g̲c̲t̲ t̲c̲a̲c̲c̲t̲c̲a̲t̲t̲ g̲c̲a̲g̲a̲a̲g̲a̲g̲a̲ g̲c̲g̲a̲t̲c̲c̲c̲g̲a̲
27101  c̲c̲t̲t̲c̲t̲g̲g̲a̲c̲ a̲g̲t̲g̲c̲t̲a̲g̲a̲t̲ g̲c̲c̲a̲t̲t̲g̲a̲t̲c̲ a̲g̲a̲t̲g̲t̲a̲g̲c̲t̲ g̲c̲c̲a̲a̲t̲a̲g̲t̲g̲
27151  a̲g̲g̲a̲c̲t̲t̲g̲g̲c̲ g̲c̲c̲t̲c̲a̲a̲t̲g̲a̲ g̲c̲a̲g̲c̲a̲c̲t̲a̲t̲ g̲g̲g̲g̲c̲t̲c̲t̲a̲g̲ c̲c̲g̲g̲t̲c̲t̲c̲a̲a̲
27201  t̲a̲a̲a̲g̲c̲a̲g̲a̲a̲ a̲c̲t̲g̲c̲t̲g̲c̲a̲a̲ a̲a̲c̲a̲t̲a̲g̲t̲g̲a̲ a̲g̲c̲c̲c̲a̲g̲g̲t̲g̲ a̲a̲g̲a̲t̲c̲t̲g̲c̲a̲
27251  g̲g̲t̲g̲c̲t̲c̲c̲t̲a̲ t̲g̲a̲t̲g̲t̲c̲c̲c̲a̲ c̲c̲a̲c̲c̲t̲c̲c̲g̲a̲ t̲g̲g̲a̲g̲c̲c̲c̲t̲a̲ c̲c̲a̲t̲c̲c̲t̲t̲t̲c̲
27301  t̲a̲c̲a̲g̲c̲a̲a̲c̲a̲ t̲c̲a̲g̲t̲a̲a̲g̲g̲a̲ t̲c̲a̲c̲a̲g̲g̲t̲a̲t̲ g̲c̲a̲g̲a̲c̲c̲t̲c̲a̲ c̲a̲g̲a̲a̲a̲a̲t̲c̲a̲
27351  c̲c̲t̲a̲c̲c̲c̲t̲c̲c̲ t̲g̲t̲g̲a̲g̲a̲g̲t̲c̲ t̲g̲a̲a̲g̲g̲a̲c̲a̲c̲ t̲a̲t̲t̲g̲c̲c̲a̲g̲a̲ g̲c̲t̲c̲t̲g̲c̲c̲c̲t̲
27401  t̲c̲t̲g̲g̲a̲a̲t̲g̲a̲ a̲g̲a̲a̲g̲t̲a̲t̲t̲t̲ c̲c̲c̲c̲a̲g̲a̲t̲c̲a̲ a̲g̲g̲a̲g̲g̲g̲g̲a̲a̲ a̲t̲g̲g̲g̲t̲a̲c̲t̲g̲
27451  a̲c̲t̲g̲c̲a̲g̲c̲c̲c̲ a̲t̲g̲g̲c̲a̲a̲c̲a̲g̲ c̲c̲t̲c̲t̲g̲g̲g̲g̲c̲ a̲c̲t̲g̲a̲c̲a̲a̲g̲c̲ a̲t̲c̲t̲g̲a̲a̲g̲g̲g̲
27501  t̲c̲t̲c̲t̲c̲t̲g̲a̲a̲ g̲a̲g̲g̲c̲t̲a̲t̲c̲a̲ t̲g̲g̲a̲g̲c̲t̲g̲a̲a̲ c̲c̲t̲g̲c̲c̲a̲a̲c̲t̲ g̲g̲c̲a̲t̲t̲c̲t̲c̲a̲
27551  t̲t̲g̲t̲c̲t̲a̲t̲g̲a̲ a̲t̲t̲g̲g̲a̲c̲a̲a̲g̲ a̲a̲c̲t̲t̲g̲a̲a̲g̲c̲ c̲c̲a̲t̲c̲a̲a̲g̲c̲c̲ c̲a̲g̲c̲c̲c̲a̲c̲g̲c̲
27601  a̲g̲t̲t̲c̲c̲t̲a̲g̲g̲ g̲g̲a̲t̲g̲a̲a̲g̲a̲g̲ a̲c̲c̲a̲t̲g̲t̲g̲c̲a̲ a̲a̲g̲c̲c̲a̲t̲g̲g̲a̲ a̲g̲t̲t̲g̲t̲g̲g̲c̲t̲
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Phosphoglycerate mutase, processed pseudogene

FIGURE 1J

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27751  tctatagaca tcttgagttg cagctgcaga tggggaccgg tggctcccat
27801  tttcatttta gccattttgt cttctgcacc cactcccttc atacattcta
27851  gtcagaatag cacttctagg gcacaggttc tcagtctaag ctgtggaaaa
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30701  atggctatta ctaaaaagtc aaaaaataac agatgctggc aaggttatgg
30751  agaaaaagga atgcttatat actgctggtg ggaatgtaaa ttagttcagc
30801  cggtgtggaa agccgtttgg caatttctca aagaactcaa aatggaatta
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FIGURE 1M

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FIGURE 1P

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48001   cagacctttc tcagtgcagg gagaaggatg agctgaatga ggaatactca
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48101   tccttgaaat ggaactcctc tttggagtgt ggaagcccag tcatgcacaa
48151   cccacttgga gcaggaagga aattgtattt gaggatgtta aagtcaagct
48201   aactttttatt aaaattgcca caggaggcca ttcatcccca cttcacttat
48251   cccacttcaa agcctacttc ccatcactca gatgtttact tatggagtga
48301   ttaagttttc ttttatcttt tctatgcttt catcagatgc tcttttttctc
48351   ttttttgctt agaaaaggca gattttttca gcctaatgtc aatatgtcaa
48401   acattaagta ttcattccct tgcaatgcac agtgtttata cttacatacc
48451   ctattataac aaatgtaata ttatttaatt atgcagcaaa cttacacata
48501   attggtgaac aggtcttaaag aatactctat acaggaagca tagagtattc
48551   agcttagctg aggcctttgt taaacaatat gcaaagttgc aggtgccaca
48601   ttagggaatt ttgggggaaa ggaaatgcaa acttatttgg caggaaaaca
48651   agagaaatga ttatatctca cagcactttc aagctggaca catttacatg
48701   cctctgtcac atcacccaga agctgtggtg ttgagggctg aggcaggaga
48751   tccttttgcc acaggaaaaa ggatgaaacg agagacattg tgaaaggttg
48801   ccccaaagtc ttaaggctcc ctgaaacctt gggtttttttg aacaccattg
48851   tccaatctgt tgaaggttaa ataatacgtt gttcaaaatt gcataggtaa
48901   agcgcagaat ggccaaaggg tcagaactac agcaataggt aggtcccatt
48951   ctctgccttt tcattcttca gtcttcggaa atgccacaga ggccaagtgg
49001   cactaggtgc agctgggaat caagatctgt ttatctgtac cttaaatagg
49051   tcaaagtgaa ccttttggaa atattgtttt ggtaaataaa aattcctggt
49101   cgtgctaact gtggctattt cgacctgttt ctttcagATA CCATTGTTCT
49151   TATCGCTTCA ATAGCAGTTG TTTCTGCAAA AACTCAGGGT AATATTTTTG
49201   CCACGTCTGC ACTCAGAAGT CTCCGTTTCC TACAGATCCT CCGCATGGTG
49251   CGCATGGACC GAAGGGGAGG CACTTGGAAA TTACTGGGTT CAGTGGTTTA
49301   TGCTCACAGC AAGgtaagat ttgctctctg aatttaaaaa cacaattttt
49351   gaaacttttt cattgatcgc tgtaatagtt aataaacctg tcacaagaaa
49401   acttagtcat tgcagaaaat ggttaaaaca attttgggac atgatgtaca
49451   atggattatt taagagccat cataaacatc caagaagtag taaagtgaat
49501   agaatcctca tagaattctt ttttccttt tcaaagattt cccacctcta
49551   aaaatctttc attcctttta tatctagGAA TTAATCACAG CTTGGTACAT
49601   AGGATTTTTG GTTCTTATTT TTTCGTCTTT CCTTGTCTAT CTGGTGGAAA
49651   AGGATGCCAA TAAAGAGTTT TCTACATATG CAGATGCTCT CTGGTGGGGC
49701   ACAgtaagta taaaaataca tttttttattt attggatgtt gtgaattgtt
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Exon 4(A)

Exon 5(B)

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49901  cattaatatt  tcttgagtgc  tagattgttg  ccaaaattaa  aaatatataa
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52751  ccctgaaagc  agtttcatat  tagtgaatag  caatacctag  ttcattgagt
52801  aagtgaaata  gatataaaag  acctggtacc  aagaacatag  gaagtgccca
52851  atcaaatatg  agagctattg  ttggtgtaga  catcattgct  gtggaagtta
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FIGURE 1R

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73151  tatctcaggg  atgcaaggat  ggttcctcct  atatttagaa  cacaaaaaag
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73301  agtcaagtta  tgcttgtttg  cagatgatat  gatcttatat  ttggaaaaac
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73401  gttgcagaat  acaaaataaa  atacaaaaat  cagcagcatt  tctatatgcc
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75051  acaaacttca catggtctca tttatttgtg gaaactaaga attaacagtt
75101  aaggattaag aaaatgtggc acatatacac catggaatac tatgcagcca
75151  caaaacagga tgagttcatg tcctttgtag ggacatggat gaagctggaa
75201  accatcattc tcagcaaact atcgcaagga cagaaaatca aacaccacat
75251  gttctcactc ataggtggga attgaacaat gagaacactt ggacacagga
75301  tggggaacat cacatactgg ggcctgtcat ggggtggggg agaggggagg
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75501  aactcacaaa gatagagagt agaatgacgg gtaccagagt atgagaaggg
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75651  gtgactatag tcagtaataa tttaattgta cattttaaaa taattaagag
75701  tataattgga ttatttgtaa cacaaaggat aaatgcttga ggtgatggat
75751  acctctttta ccctgatatc atcattacat atcgcatgca agtatcaaaa
75801  tatcccacat aactcataaa tatatataac tactgtgtac ccacaaaaat
75851  taaaaattat taataaaatta ttagtttgat ttaaaaaaaa caaggatgct
75901  cacttttgcc acttctattc aatatagtag tggaagtcca tgccagagca
75951  gttagacaag agaaagaaat aaaaggcatc caaataagaa aggagaaag
76001  gaaattttg ctgtttgctg acaacataat cttatatata gaaaaccta
76051  aagattccag aaaaaaactg ctagaactaa taaattcagt acagttacag
76101  gagacacaat caacaccaca aaaatcacta gcatttctat acactaacaa
76151  caaactttcc aaaaaagaaa tcaagagagc aatcccattt acagtagcta
76201  caaaaattaa aatacttagg aataaattta accaaggagc tgaaagacct
76251  gtacacagta gtctataaaa tattaaaaaa ataaattgaa gaagtcacta
76301  atccttttta aatccaccat gccccagtcc agctgaacaa ctcatacttt
76351  tcagaatcta ctctatgtgt tctcactgtt ctgcagctag ccacctcttt
76401  ctcctcccta gatcaccttc tttatcattt ctgcttctca aaatgttacc
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76651  aagaactatg ccctcatttt tgttccacta caaatcttaa cacatacctt
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76751  ctaaattaac ataaattatt atttgtgtac tgatccagtc ctaaatccat
76801  ggtgctatca tttctgtatc actgatggtt atccacttac ttaaataatc
76851  tttccttaaa tacacttaga aaagacggaa aactgtgtta taagggagga
76901  acaagtatgt aggttattcc tttccttaaa caaagagaag ttctgtcatg
76951  cgtcacggaa aattaaagca cagtaataaa agcacgaac aagatttgtt
77001  gaataatgat ttagtggaaa cgttgcttgc ctcctgttca taggtcctaa
77051  ctttcctctc aagtacttaa gctgcacatt ctatttattt tgtttctagA
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<u>77101 TTACATTGAC AACTATTGGC TATGGAGACA AAACTCCCCT AACTTGGCTG</u>
<u>77151 GGAAGATTGC TTTCTGCAGG CTTTGCACTC CTTGGCATTT CTTTCTTTGC</u>
<u>77201 ACTTCCTGCC</u> gtgagtatct ttgcaccaat aaagcagttt aaattagatc　　|Exon 6(E)|

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77251  ttagagactt attagagtga gctctcacaa attcgtatgc ttgggaacat
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77351  aaatatatct acttggataa tttataaaat atggtcttcc cttggagaca
77401  cttaatctga gactttattt aatgtaggct catctttgt gaccaaataa
77451  tcattcagat ggctcacttt ttaggcaaca tgctactaag acatttaaaa
77501  tatttgcaaa gatttaaagc tatattcttt taaaactgat ccttccaatt
77551  tggtttataa tgtgtgctac ttaagagaca gatgtgcaca atggagtatt
77601  tttctcttca gatccatttg agtgaaaagc atatgacctt aaagggtgtt
77651  aaacatgtca gatgatttat tcattgtgtc atcatcattg attttttttaa
77701  tgagcagttt ctgtatctta tcagaataaa gggcacattt atctgccccc
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77901  gaggagccaa taaaaggag ggttaacgcg gtgggagcag aagtgcttaa
77951  ggaaaataga tccagtcttg ctccagacac agctcaagct gtgccaacca
78001  gagaccccag agcacctctc caaagctctt ttaggtggta gggcttctcc
78051  tctgcctatt aataagtgca gagaacaccc ttgtcccacc agtgcccaac
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78151   gagactgaaa aggccatgca tatgcttggg tactagacct cagtttgaat
78201   acatctttgt cacatactaa ctatatgact gctttagttt actagggctg
78251   ccttaacaag taccacagac tgggtgactt aaacaataga aaggtattgt
78301   ctcacagttc ccaagactgg acgtccaaaa tcaaagcatt gagaaaccac
78351   gagagccatg agagaaagaa ctgttccagg cctctcttct tggcttatag
78401   atggctcttc ttcctgtgtc ttcacatcat ctgtgtccaa atttctactt
78451   cctagaagaa caccagtcat atttgattag ggtccatcct aatgacctcg
78501   ttttaacttg attacctctg taaggaccct attttcaaac aaggtcacat
78551   tctgaggtca tggggattag gacttcaaca tatgaatttt ggaaggacgc
78601   aattcagcct gaacagtgac cctgaataag tttcttttt aatagaatgg
78651   aggaagaatt attgagccca gagaaatttt gtgcggacca atgtaataat
78701   gtaagtcaag tgcttgtcat gaagagaact ctcaataaat gttacttccc
78751   tttgcctgta tgaatctaga aatacatgtt tcctggaaca aaacgatgaa
78801   atccaggaga attaaaaaaa aaaatcttac gtatccaagg caacttcatc
78851   tggcaatctc aacaattcag aacagagaag agattcactc aataatcaga
78901   ttccctacag gaaaatacct ttagaaacaa tacaacgcag tcttgggttt
78951   tttcccaaaa taatggcaca aaataattgc aactttgtg tttatattta
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79251   cagaaagaaa tggtaaaaga ctaacagcaa agaagggaaa aggaaatctg
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79451   aaaaaggcag tccccataat gaaactctaa actatcacag ggaggttaaa
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79551   aatgtttcca ataaagtaag tatgaaattt ttatatgcaa attaaattaa
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79851   gacattttgc tgagaaagct agaggtggat tgtgggctgc ccctatgtag
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81151   ccgaacctca catccacatc ataagtgctc aaaatggtag ctagtgctgt
81201   taattcaatg tctgcaaaat ctaaattatg ctccatacaa gtggattata
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83101   aacagtgctt  ttgaaatttt  tgagtgccat  ttttgtattt  tgttccagGG
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83201   AACACTTTGA  GAAAAGAAGG  AACCCAGCTG  CCAACCTCAT  TCAGgtaaat
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85051  tactgttctt atcctttaat tttccttcac tctagaacaa cgttttccaa
85101  cctgtgagtg cagaagttat tgcatgggtt cctttcatcc gtctgagcac
85151  caagctctgt ctacatatgg aaccaataat acattttaca caataaaacc
85201  tcttggaata tcagctgttt tgttagaaag tgagctcttt gaggaatttc
85251  tcatgcacat atcaattgtg atgatacaaa gctgtgccgc tcaatacagt
85301  aaccactagc tacatgtagc tttttacatt taaattaatt aaaattaaaa
85351  accaagtttg ccaatggcac tagccacttc tcaagtgttc aatagctaca
85401  ggtggctatc ggctgccata ccatacaaga gaaatataga gaataactgc
85451  aggaaatctc ctgatctaac ttgtcattat tgactactaa actgtgcaac
85501  aataatttcc aattgaactt gaaaataaat tgttatttct acagcaaatc
85551  attggagcag aggcatttat atgtctacag tcaaaatgag gcaaggcctc
85601  cctcacaggt aaccctgtgg aggacaggct aattgaacag tttttacttgg
85651  aggcctagaa ttttattta tggaactggg ttatgtaaca tatattgtga
85701  tcagtaattg aacttgtaca aatgcaggta acaatgaagt aaaatcgtga
85751  gttttttattt tacttaaaac tccaacttaa atgttgttct taacaaaaat
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85951  tattaatttg ttcattgttc ttccttgcta tagtctttag acagaattca
86001  aggcttttaag ccttgattat atattataga aatttatatt tcaggatgta
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86151  tctcatttat tttaggccag agtcactgtc ttcttaaaag ggcaactgag
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86251  catttcaggg tttttaggaaa aaaatttaaa accccagaag cttgcagcaa
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86451  aagtgctttt tagtttgcag ggtgcttcta atacattatg ttacttgatc
86501  ctcgagacaa gcctaggagg agctaggact caaatccctg ctgtctgaat
86551  ctgaatccat tacccctttc aaaaagcagc atttacatcc tcataaatat
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86851  aaataaaaac agtgccaggt gtggtgactc atgcccgtaa tcccagcatt
86901  ttgagagggc aaggtgggag gattgcttga gttcaagatc agtctgggca
86951  atatagtgag accacatttc tttaataaat aaataaataa gaacagactc
87001  agaaaaaaaa atcttagatg tgaaaaacat gaaggcagga aaaaaaacag
87051  aaggtaagat aaagttgtga aaatttccct gaaactagaa taaacagaga
87101  ttgaaaataa agcaaaaaag ataagaaaca tgaagtgtcc atccaggcat
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87251  ggacaggagt ggccacagta gaagagctca ccaagtgtcc agcactgtga
87301  accaaaaact tcacaccaag attatcacag taaaatatca gaaaacttac
87351  caaaagggga tcctaaatgc tttctgagca ggacagagcc aaaggaacaa
87401  gaataaggat gacataggat ttctcattag taatccaaaa attagaagac
87451  aatgaaacaa tactttcgaa attatagaaa ttattttcaa cctagaacgc
87501  tatatccagc caaaccacca tcaagtgtga gagcagcacc aaggcacttt
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87651   gaaagagaca tggagtcaag aaaacaagag attccgcaca ggaaagagca
87701   aagggggattt ctatgataat agggaaggga agtcccaaga caacagctat
87751   gcaggccttg agaacagaat gagaaggagg ctgagagctc caggagaaag
87801   atcttcaagg aagcgaaaga atggagttct cagatttcat gatgcatttg
87851   accagaggaa ttttatagtt ctgttggaaa gatctggaat gtaatcataa
87901   caggtacata taggcaaatc aagaaattaa aataggggcaa ttataactcc
87951   aaaaaaacca aaaacttgta taagaaagaa agagcagcca tagtacatca
88001   cattgctgaa ctgggaacag cagttacatt gtcataataa tattaaatag
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88101   ggaagagggc atgtaagtgg gcaatatcat tatcgttcag gataggaagt
88151   taattgataa tgtctaaaat tgaaaaatca agaaatataa ctataagcat
88201   aatccttaaa aataagcatt cttggctgga cgcaagtggc tcatgcctgt
88251   aaccccgca ctttgagagg ctaaggtggg aggatcactt gaggccagga
88301   gttcaagacc aacctgtgca acatagcgag accccacctc tacaaaaaaa
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88401   tagctactca ggaggctgaa gccagaggat tggttgagcc tgggagtttg
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88501   agtatgaccc tgtctcaaaa ataataataa taataaataa ggattcttaa
88551   aaatagaagc aacaactata agaattgaag gggttgcctc tgaggaacag
88601   aaagtagtgt gaagaaagat gtggaaaggg attgctggtt catagcctaa
88651   aactttcagg actttcacat tttaaactct gtaccttgaa aaaataagct
88701   ctgtgttcat tattcctttg gatggtcagc tgaaacgttc taaaccatttt
88751   ccagtaagga tcaaacatgc cataatggta atacttgcaa gacaaacaaa
88801   atactcccaa aaaaactgaa ttatactggc cttgtactta ttgagcaaag
88851   tccaaatctc tttgactgcc tagagcacca gcatcacctg ataaatggca
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88951   accatgtaaa ttaaccatag gaaatccctc taagtgttat ttttctcttg
89001   ccaactactg tgtgattttg gctttaaata taggaacatc agctactgga
89051   tcacagggat gtgggttcaa agttcagcta ctagaaacaa tttgctaaga
89101   gagacctaag aacaaaataa agttattaga gtgtaacggg catagagttc
89151   cactttccac cttcattttt actgttaact aatatcagcc atgtgacaga
89201   tgccacctgc accttccata cctctcattt aaaaggcatt tttgggagat
89251   gagtaatgaa gggaacaaga gcttagctgt tgggatcaat ctgagagaaa
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89401   ggtcccattc ttttgttgtt ctgttgtttt ggatttttc actggtatct
89451   aataatgtgc agacctgcca tatgcttcta gttctacagg agtcttgctt
89501   tcaatgtatc aaaaatcata tatgtgtgac atcttctatg gaaattgttt
89551   aattaaggca gccgtctgtg tcatcacaac attagaggat ctctgggcat
89601   cactactaca gaagaagctg caatcctaaa tccatgtgtt ttccttaatt
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89901   ctttctgaaa tttcattgaa gtacaatgtg catgcagaaa agagcacata
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90351   cctaggagtg tgtagttgta tcataggata cttaaatgtt cagctttcgt
90401   agaaacttcc agttttccca agtagttgtg tgaattttta acttttatttt
90451   agcatacatt tattcaatga tattctcagg aaaaggaata ttgttagatc
90501   acattttctt cattatggat ttcacaatca tgactgatgt gttatgtact
90551   agggatgtgg cccatttaaa tgaattggtc tgccaggcat ggtggctcat
90601   gcctgtaatc ccagcacttt gggaggccga ggtggcagat cacctgaggt
90651   gaggagttca agatcagcct ggccaacata gtgaaaccct gtctctacta
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90751   actcaggagg ctgaggcacg agcatcgctt gaacccagaa ggcagaggtg
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90851   gaccctgtct caaataaata aataataaat aaataggttt gtcacataaa
90901   ataaaatgtt ttgattaatc tactataata aaaaagtttt ctctgagggg
90951   actggagtaa atacctggcc attagagatg tttgcagact cattaaaaag
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91101   agcaagtctc cgtggaggga ttctatgact gacagccagg caatctgaga
91151   tattgtctca actccaccaa cttttgtataa acctcttcat ttatctgagc
91201   ccttttttttc tcacctacaa aataggaatc ttaattcaca ctttgatggt
91251   gaggatcaca taaaaatact ttgtcttatg tatgccaggt gtaattatat
91301   gaaatggaga gagttgatgt tttacatcaa agagctataa acatattctt
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91551   taatggattt tcattagtcc tttgcttctc ccttatcaaa tattgattaa
91601   agatcaatct ctagaatgta tgctcatgct caagtcgctc acctaactac
91651   tatcttggat attagcattt aaccagtcaa tcattacttt ttgttttgga
91701   taatatagta tctttccctt accaattcaa aaattacatt atattgcact
91751   ttttgggcct tttgcttctt ggtatgttgt tttgaaaaga agctctggcc
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91851   ggcggatcac ttgaggtcag gaatttgaga ccagcctggc cagcatggtg
91901   aaactccatc tctactaaaa gtacaaaaaa aaaaaaaat agccaggcat
91951   ggtggtgggc acctgtagtc ccagctactc tagaggctga ggcacaagaa
92001   tcacttgaac ccagaaggca gagattgcaa tgagctgaga tcgcaccact
92051   gcactccagc ctgggcaaca gagtgagagt ccatctcaaa ataaataaat
92101   aataaaataa aataaaataa aagaagttct gatgtggtgc aatatgttta
92151   acagccagct gaaaatgcca aagtagcctt cttcctcctt tgggtattta
92201   tcagggctaa gtataagagg caaaagattc ttcatgtgta gtaacttaat
92251   catttctctt tttattttat tctaaatcct gctctctttt ttctttttca
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92351   TGAGAAATCT GTTTCCATTG CAACCTGGAA GCCACACTTG AAGGCCTTGC
92401   ACACCTGCAG CCCTACCAAg taggtatcag tgtgacagct gccactgtag
92451   ttgagtcttt tcaagtctgt taaacaaacc atacccacac acacaaaaaa
92501   aggtgttaat gtttggcttc tcttattctc tgttgctcct agagagattc
92551   aaacctattt agtagcagtt ctggcacaaa actaaatgga atcagtatca
92601   ttcctcacaa tccacagact ggggttaaag attaaaataa tgtaaatttt
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92701   gtaaagccca ccagcatcct aaaggtaagc accacagttc ttgaaaaaca
92751   aggattattt attttgcacc catcgcctga ccccaagaga tgagtgctta
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92851   tggatcctct ctggatggtc ctcaagcttt tacttgcaga tcaaactcac
92901   atcagtggca aaaaagaga aaaataggag tcctaatagg attatagttt
92951   acaatgaggc aatgggaccc agcggattaa aatttggaat ttgcattcac
93001   aattttaaag taagactact tttcttcaca tttcattggc caaagtaaat
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93101   tttaccatgt gcctagaagc aggcaagaac caaggacatt atggacagtc
93151   ctaatgatta ccacagagat ctgtaattaa aaaaaaaaa aagggcttag
93201   tcttggagtc ttggaaacct ggactccagt tcaactatca cagaaaatgt
93251   taaatcatat tcaccaccta attaaagaag tcctcattga aataccgaag
93301   cagtaagtca tgagaaaggc tttctgtgag tcacccagct tgattagcgt
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93751   aaaattcttg tcagcaccta ggacagagat attcatagca ctccagggat
93801   ttcagagagg atggaacctt agcatggata gaagcatgga tgctgttgaa
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Exon 8

FIGURE 1AE

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94001   aaaaataaaa attatataga aattgtattt cttgtcttca tgaagtttgc
94051   taggtaaatg taaaaaggga atctgagtag gaaaactgat agagaattct
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96201   tggatcttgc atgaaaagag ttacttaagg tatttgattc cccaatctcc
96251   aatttggcca ttatcaagtg ctataaatat attcactggt ttatcatcat
96301   ttctcttctg cctgcacgca cctgaag<u>GAA AGAACAAGGG GAAGCATCAA</u>  ┌──────────┐
                                                                 │ Exon 9   │
96351   <u>GCAG</u>gtttgt gatttctctc ttgctacatg tttgtttata aatctgatac  └──────────┘
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96451   acaagatgat taaaagtgac ctttcacaag attgcctgca aagattgcta
96501   ttttattgat atttcgcccc ttagtatcaa agtgtctttc cctaactcac
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96601   ggaggggaac tgatcttgga ttagtccttg ctgttgtttt cccagacaga
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96701   attttttttc tgaatgtaaa aagtccaggc agcagtctag gatacactcc
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96851   tatacatata cacatacata cattatatgt atatgtatat atacctatac
96901   atataatctt ttttttttgg caagatgaaa ccacctctct gtgacatctc
96951   cagatctcca gcccactgag tgctgaggtc tactcaagtg actcaaagag
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FIGURE 1AH

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FIGURE 1AM

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121601  agtgtgttca  ccttgctctg  gactaagact  gaggtccttc  attcatgtcc
121651  tgtacggttc  tacaaatata  ctatcctcct  agtagcatct  tattgagtga
121701  ttaaaagaaa  tgaattccac  atgttaattc  caaccacata  tggttgattg
121751  tgattatctc  aaagccaaaa  tattcagtaa  attcagtttt  ttaagagcct
121801  tgctttatta  ccagcacaaa  ttaccagcat  ttgtgattgt  atagtgccca
121851  aaatgcaagg  actgagactt  gacttttttt  tatgcccccc  agcacactta
121901  gcccagtgtg  aggcatataa  tgggcccttta  gtaaaatacc  tgttcatcaa
121951  ttgttataga  aataacaatt  tgttaattca  tttagcaggt  aattattgag
122001  cccatcatgt  gtgccaggac  ctgtggacat  ccagagattg  ataaaataat
122051  gacccagacc  ttgtagagtt  tgcagtttag  taaattagat  gnnnnnnnnn
122101  ngaacatctg  aacatgacca  gagattgtgg  tcatattgca  atctctgcct
122151  agatggccat  ggccttctaa  gttctttaat  aaaactgtct  acagctccca
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122201  aggttttata aagttgaact gctacagaat ttatagaacc aatcttgggt
122251  ttctagctca tgtatcttct ccaacttgaa ctccgaaaga aaaagaccat
122301  ggctttctta tctgcttatc tttcacacat gtacaataga tgctcataga
122351  ataatctgtt ctattaatgt aagatctcta tagttatgat ttttgtcata
122401  ttttgaaatg gttaaattca ggaactgcct gatcagaggt agaaacatat
122451  tactttgtag tttaggacac ttttacttcc agaagatcac ccataagtga
122501  tttcatcttg gaccagaata atgagaaaat taatttcatg tgtaatctca
122551  tgttcaaata agcatatcaa ctggaacaag ttctttctta tttcatcatta
122601  cataaattga agataactgt atttaatttt tttttccaaa actcttcatt
122651  ctgacctagg gcaatctcca ccttcagccc tcataatcag atctcctctt
122701  tctctgatag TGTTGATCAA ATTCTTGGAA AAGGGCAAAT CACATCAGAT
122751  AAGAAGAGCC GAGAGAAAAT AACAGCAGAA CATGAGACCA CAGACGATCT
122801  CAGTATGCTC GGTCGGGTGG TCAAGGTTGA AAAACAGgta caactcaact
122851  acgctgggta tctttttagc cagaattttt ttaatcaaaa tttattatag
122901  gcaattgtat gtattccagt gattatttta aaataaataa aatcacaaaa
122951  agagtgaata aaattaaatt ttctttgtgt gtagacagtg ctctctgaaa
123001  cactctggat ttcccttta ggaatagaaa atctcatctc atcaattaat
123051  agttaattgg aaacaactat agatttccaa tagttgaaaa tcgtttaaaa
123101  ataacaaaga tctattcttc atttgtgttt cagttgtttt tattgtttct
123151  tttttaggtc attaattttt tttttttttt tttnnnnnnn nnngggacta
123201  tgggcatgca ccaccacacc tggctgattt ttgtattatt tttggtagag
123251  acgaggtctc accatgttgc ccaggctggt ctcaaactcc tgggctcaat
123301  tctcctgcct cagtttccca aagtgctggc attacaggca tgagccactg
123351  cacccagcct ggaatggaaa gtcttaaagt tgcattttta tagtgcttat
123401  atgactttta agaggcacta tttaaagaag tggtggggga gagatgctaa
123451  taaagactgt atagaagcca aagtgtccct ctcttcctaa gtcctcctct
123501  ggccccatca ttgctaaatg ttacattcac taagggtcaa gactgcatcg
123551  tactttatat tcaatatttc tttaaatgtg ttggcacacc ttgacttcat
123601  ttttcaaaat taaaaaatga agtccattct taataacaga ttatactcat
123651  gtgtaaccat tttccttact tctagGTACA GTCCATAGAA TCCAAGCTGG
123701  ACTGCCTACT AGACATCTAT CAACAGGTCC TTCGGAAAGG CTCTGCCTCA
123751  GCCCTCGCTT TGGCTTCATT CCAGATCCCA CCTTTTGAAT GTGAACAGAC
123801  ATCTGACTAT CAAAGCCCTG TGGATAGCAA AGATCTTTCG GGTTCCGCAC
123851  AAAACAGTGG CTGCTTATCC AGATCAACTA GTGCCAACAT CTCGAGAGGC
123901  CTGCAGTTCA TTCTGACGCC AAATGAGTTC AGTGCCCAGA CTTTCTACGC
123951  GCTTAGCCCT ACTATGCACA GTCAAGCAAC ACAGGTGCCA ATTAGTCAAA
124001  GCGATGGCTC AGCAGTGGCA GCCACCAACA CCATTGCAAA CCAAATAAAT
124051  ACGGCACCCA AGCCAGCAGC CCCAACAACT TTACAGATCC CACCTCCTCT
124101  CCCAGCCATC AAGCATCTGC CCAGGCCAGA AACTCTGCAC CCTAACCCTG
124151  CAGGCTTACA GGAAAGCATT TCTGACGTCA CCACCTGCCT TGTTGCCTCC
124201  AAGGAAAATG TTCAGGTTGC ACAGTCAAAT CTCACCAAGG ACCGTTCTAT
124251  GAGGAAAAGC TTTGACATGG GAGGAGAAAC TCTGTTGTCT GTCTGTCCCA
124301  TGGTGCCGAA GGACTTGGGC AAATCTTTGT CTGTGCAAAA CCTGATCAGG
124351  TCGACCGAGG AACTGAATAT ACAACTTTCA GGGAGTGAGT CAAGTGGCTC
124401  CAGAGGCAGC CAAGATTTTT ACCCCAAATG GAGGGAATCC AAATTGTTTA
124451  TAACTGATGA AGAGGTGGGT CCCGAAGAGA CAGAGACAGA CACTTTTGAT
124501  GCCGCACCGC AGCCTGCCAG GGAAGCTGCC TTTGCATCGA ACTCTCTAAG
124551  GACTGGAAGG TCACGATCAT CTCAGAGCAT TTGTAAGGCA GGAGAAAGTA
124601  CAGATGCCCT CAGCTTGCCT CATGTCAAAC TGAAATAAGT TCTTCATTTT
124651  CTTTCCAGGC ATAGCAGTTC TTTAGCCATA CATATCATTG CATGAACTAT
124701  TTCGAAAGCC CTTCTAAAAA GTTGAAATTG CAAGAATCGG GAAGAACATG
124751  AAAGGCAGTT TATAAGCCCG TTACCTTTTA ATTGCATGAA AATGCATGTT
124801  TAGGGATGGC TAAAATTCCA AGGTGCATCG ACATTAACCC ACTCATTTAG
124851  TAATGTACCT TGAGTTAAAA AGCCTGAGAA ACCAAACACA GCTAATGCTA
124901  TGGGGTGTAT GAATATGTCA AGTTTAGGTC ATTTAGAAGA TTTGACACTG
124951  TATTTTGAAA TTATGGGAGT AAACACCTTC AAATTTCAGG CATTTCTGCT
125001  TTGTGACTAA ATACAAACTA CATTTTCAAG ATTAGGCCAT AATGTATATT
125051  TAAACACAAT GGCTATCAAC AGCTGCTAAT AAGGTATCAA CTAAAGCAGA
125101  ATTGGGGAAT AATAGAAATG GCTGCTTATT TCAAGATATA TTTGCCAACC
125151  CATTCCTATT CAGTCATTTT ATTATTAATG TAATTTGAAT GTCAATTTGT
125201  GTGCTTTTGG TGATTTAGCG CTGTGGCAAG CAATTTTGCA CATCATTTTC
125251  ATGTTGTTCT TTATGACAAG AATGTTCTTC AATTAGAAAA TGTGCAAATA
125301  ATGAAATTCA GGGCCAGTGA GGCAAATAGA CTATCTGACA TATTTGACTT
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Exon 13

Exon 14

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125351  TATGAAAACA TATTGCCTGA TGGCAGAATC AACTTTATAA GTGGTCAACT
125401  TCTACACAAG CGTATGAAAT ACTGGTCAGT AGAACAGCCA TTGTGATTGG
125451  ACTGGTTTCT CTGCAATGGC GCCAACCCCA GGCTTGCCAA TACTGCCTAT
125501  GTAAAGGGCA AGTGTGAGAA GCTATTCTCA TTTCGCTGAC ATACAGGTAG
125551  GACTATGGGG GATGGGACAT TTGAGTGGGA CTGAGATAGG AAAGGCTTGA
125601  AAAGAACCCA GAAACACCAC CAGGAAGTTG GCAAAGTAAA AGAAAATGAC
125651  TTCCCCCTCA AAGGGCAATG AGAGGGAGAG AAACAAACCA AAATAGAAGA
125701  ACTAGACTTT TTAGAAAATG AGTATTGCTA GGGAATTCAA CTACCTAATC
125751  TTCCCTTATT CTTATATATA AGCAGAGAAT TTTTGCAAGG TATTTATTTT
125801  TTAATATGCC CTGAATGTCT TTTGCTATTA TGTGTACATT TTGCATATGA
125851  AAGTCTAAAA CGAAACTTCC TTTACTTTTT ATACTGTAGT GAAAATTTTC
125901  TATTCTTCCC AAGAATGTTG TCCCAAATCT GAAATTACTG GTTCAATTTC
125951  CTGATATAAA
```

KCN6q cDNA

```
  1   CTGGAGTGAGGCGCGGGAAGATGCCTGGTCCTTGCCTCGCGGACTTGGCA      50

 51   GCCGCGTCCTGCGGGTCTGTCCACTGAACTGCTGAGGACTGCGGCGGTGG     100

101   CCTGAGGGAGAGCCGCCGGGGCAAGCAGGGGGCCCGGATGAGCCTGCTGG     150
  1                                            M   S   L   L   G       5

151   GGAAGCCGCTCTCTTACACGAGTAGCCAGAGCTGCCGGCGCAACGTCAAG     200
  6    K   P   L   S   Y   T   S   S   Q   S   C   R   R   N   V   K    21

201   TACCGGCGGGTGCAGAACTACCTGTACAACGTGCTGGAGAGACCCCGCGG     250
 22    Y   R   R   V   Q   N   Y   L   Y   N   V   L   E   R   P   R   G    38

251   CTGGGCGTTCATCTACCACGCTTTCGTTTTTCTCCTTGTCTTTGGTTGCT     300
 39    W   A   F   I   Y   H   A   F   V   F   L   L   V   F   G   C   L    55

301   TGATTTTGTCAGTGTTTTCTACCATCCCTGAGCACACAAAATTGGCCTCA     350
 56    I   L   S   V   F   S   T   I   P   E   H   T   K   L   A   S    71

351   AGTTGCCTCTTGATCCTGGAGTTCGTGATGATTGTCGTCTTTGGTTTGGA     400
 72    S   C   L   L   I   L   E   F   V   M   I   V   V   F   G   L   E    88

401   GTTCATCATTCGAATCTGGTCTGCGGGGTTGCTGTTGTCGATATAGAGGAT     450
 89    F   I   I   R   I   W   S   A   G   C   C   C   R   Y   R   G   W    105

451   GGCAAGGAAGACTGAGGTTTGCTCGAAAGCCCTTCTGTGTTATAGATACC     500
106     Q   G   R   L   R   F   A   R   K   P   F   C   V   I   D   T    121

501   ATTGTTCTTATCGCTTCAATAGCAGTTGTTTCTGCAAAAACTCAGGGTAA     550
122    I   V   L   I   A   S   I   A   V   S   A   K   T   Q   G   N    138

551   TATTTTTGCCACGTCTGCACTCAGAAGTCTCCGTTTCCTACAGATCCTCC     600
139    I   F   A   T   S   A   L   R   S   L   R   F   L   Q   I   L   R    155

601   GCATGGTGCGCATGGACCGAAGGGGAGGCACTTGGAAATTACTGGGTTCA     650
156     M   V   R   M   D   R   R   G   G   T   W   K   L   L   G   S    171

651   GTGGTTTATGCTCACAGCAAGGAATTAATCACAGCTTGGTACATAGGATT     700
172    V   V   Y   A   H   S   K   E   L   I   T   A   W   Y   I   G   F    188

701   TTTGGTTCTTATTTTTTCGTCTTTCCTTGTCTATCTGGTGGAAAAGGATG     750
189    L   V   L   I   F   S   S   F   L   V   Y   L   V   E   K   D   A    205

751   CCAATAAAGAGTTTTCTACATATGCAGATGCTCTCTGGTGGGGCACAATT     800
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206     N  K  E  F  S  T  Y  A  D  A  L  W  W  G  T  I     221


801     ACATTGACAACTATTGGCTATGGAGACAAAACTCCCCTAACTTGGCTGGG    850
222     T  L  T  T  I  G  Y  G  D  K  T  P  L  T  W  L  G    238


851     AAGATTGCTTTCTGCAGGCTTTGCACTCCTTGGCATTTCTTTCTTTGCAC    900
239     R  L  L  S  A  G  F  A  L  L  G  I  S  F  F  A  L    255


901     TTCCTGCCGGCATTCTTGGCTCAGGTTTTGCATTAAAAGTACAAGAACAA    950
256     P  A  G  I  L  G  S  G  F  A  L  K  V  Q  E  Q    271


951     CACCGCCAGAAACACTTTGAGAAAAGAAGGAACCCAGCTGCCAACCTCAT    1000
272     H  R  Q  K  H  F  E  K  R  R  N  P  A  A  N  L  I    288


1001    TCAGTGTGTTTGGCGTAGTTACGCAGCTGATGAGAAATCTGTTTCCATTG    1050
289     Q  C  V  W  R  S  Y  A  A  D  E  K  S  V  S  I  A    305


1051    CAACCTGGAAGCCACACTTGAAGGCCTTGCACACCTGCAGCCCTACCAAG    1100
306     T  W  K  P  H  L  K  A  L  H  T  C  S  P  T  K    321


1101    AAAGAACAAGGGGAAGCATCAAGCAGTCAGAAGCTAAGTTTTAAGGAGCG    1150
322     K  E  Q  G  E  A  S  S  S  Q  K  L  S  F  K  E  R    338


1151    AGTGCGCATGGCTAGCCCCAGGGGCCAGAGTATTAAGAGCCGACAAGCCT    1200
339     V  R  M  A  S  P  R  G  Q  S  I  K  S  R  Q  A  S    355


1201    CAGTAGGTGACAGGAGGTCCCCAAGCACCGACATCACAGCCGAGGGCAGT    1250
356     V  G  D  R  R  S  P  S  T  D  I  T  A  E  G  S    371


1251    CCCACCAAAGTGCAGAAGAGCTGGAGCTTCAACGACCGAACCCGCTTCCG    1300
372     P  T  K  V  Q  K  S  W  S  F  N  D  R  T  R  F  R    388


1301    GCCCTCGCTGCGCCTCAAAAGTTCTCAGCCAAAACCAGTGATAGATGCTG    1350
389     P  S  L  R  L  K  S  S  Q  P  K  P  V  I  D  A  D    405


1351    ACACAGCCCTTGGCACTGATGATGTATATGATGAAAAAGGATGCCAGTGT    1400
406     T  A  L  G  T  D  D  V  Y  D  E  K  G  C  Q  C    421


1401    GATGTATCAGTGGAAGACCTCACCCCACCACTTAAAACTGTCATTCGAGC    1450
422     D  V  S  V  E  D  L  T  P  P  L  K  T  V  I  R  A    438


1451    TATCAGAATTATGAAATTTCATGTTGCAAAACGGAAGTTTAAGGAAACAT    1500
439     I  R  I  M  K  F  H  V  A  K  R  K  F  K  E  T  L    455


1501    TACGTCCATATGATGTAAAAGATGTCATTGAACAATATTCTGCTGGTCAT    1550
456     R  P  Y  D  V  K  D  V  I  E  Q  Y  S  A  G  H    471
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1551  CTGGACATGTTGTGTAGAATTAAAAGCCTTCAAACACGTGTTGATCAAAT  1600
472   L   D   M   L   C   R   I   K   S   L   Q   T   R   V   D   Q   I    488


1601  TCTTGGAAAAGGGCAAATCACATCAGATAAGAAGAGCCGAGAGAAAATAA  1650
489    L   G   K   G   Q   I   T   S   D   K   K   S   R   E   K   I   T   505


1651  CAGCAGAACATGAGACCACAGACGATCTCAGTATGCTCGGTCGGGTGGTC  1700
506    A   E   H   E   T   T   D   D   L   S   M   L   G   R   V   V    521


1701  AAGGTTGAAAAACAGGTACAGTCCATAGAATCCAAGCTGGACTGCCTACT  1750
522   K   V   E   K   Q   V   Q   S   I   E   S   K   L   D   C   L   L   538


1751  AGACATCTATCAACAGGTCCTTCGGAAAGGCTCTGCCTCAGCCCTCGCTT  1800
539    D   I   Y   Q   Q   V   L   R   K   G   S   A   S   A   L   A   L  555


1801  TGGCTTCATTCCAGATCCCACCTTTTGAATGTGAACAGACATCTGACTAT  1850
556    A   S   F   Q   I   P   P   F   E   C   E   Q   T   S   D   Y    571


1851  CAAAGCCCTGTGGATAGCAAAGATCTTTCGGGTTCCGCACAAAACAGTGG  1900
572   Q   S   P   V   D   S   K   D   L   S   G   S   A   Q   N   S   G   588


1901  CTGCTTATCCAGATCAACTAGTGCCAACATCTCGAGAGGCCTGCAGTTCA  1950
589    C   L   S   R   S   T   S   A   N   I   S   R   G   L   Q   F   I  605


1951  TTCTGACGCCAAATGAGTTCAGTGCCCAGACTTTCTACGCGCTTAGCCCT  2000
606    L   T   P   N   E   F   S   A   Q   T   F   Y   A   L   S   P    621


2001  ACTATGCACAGTCAAGCAACACAGGTGCCAATTAGTCAAAGCGATGGCTC  2050
622   T   M   H   S   Q   A   T   Q   V   P   I   S   Q   S   D   G   S   638


2051  AGCAGTGGCAGCCACCAACACCATTGCAAACCAAATAAATACGGCACCCA  2100
639    A   V   A   A   T   N   T   I   A   N   Q   I   N   T   A   P   K  655


2101  AGCCAGCAGCCCCAACAACTTTACAGATCCCACCTCCTCTCCCAGCCATC  2150
656    P   A   A   P   T   T   L   Q   I   P   P   P   L   P   A   I    671


2151  AAGCATCTGCCCAGGCCAGAAACTCTGCACCCTAACCCTGCAGGCTTACA  2200
672   K   H   L   P   R   P   E   T   L   H   P   N   P   A   G   L   Q   688


2201  GGAAAGCATTTCTGACGTCACCACCTGCCTTGTTGCCTCCAAGGAAAATG  2250
689    E   S   I   S   D   V   T   T   C   L   V   A   S   K   E   N   V  705


2251  TTCAGGTTGCACAGTCAAATCTCACCAAGGACCGTTCTATGAGGAAAAGC  2300
706    Q   V   A   Q   S   N   L   T   K   D   R   S   M   R   K   S    721


2301  TTTGACATGGGAGGAGAAACTCTGTTGTCTGTCTGTCCCATGGTGCCGAA  2350
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722   F   D   M   G   G   E   T   L   L   Ṡ   V   C   P   M   V   P   K   738

2351   GGACTTGGGCAAATCTTTGTCTGTGCAAAACCTGATCAGGTCGACCGAGG   2400
739   D   L   G   K   S   L   S   V   Q   N   L   I   R   S   T   E   E   755

2401   AACTGAATATACAACTTTCAGGGAGTGAGTCAAGTGCCTCCAGAGGCAGC   2450
756   L   N   I   Q   L   S   G   S   E   S   S   A   S   R   G   S   771

2451   CAAGATTTTTACCCCAAATGGAGGGAATCCAAATTGTTTATAACTGATGA   2500
772   Q   D   F   Y   P   K   W   R   E   S   K   L   F   I   T   D   E   788

2501   AGAGGTGGGTCCCGAAGAGACAGAGACAGACACTTTTGATGCCGCACCGC   2550
789   E   V   G   P   E   E   T   E   T   D   T   F   D   A   A   P   Q   805

2551   AGCCTGCCAGGGAAGCTGCCTTTGCATCAGACTCTCTAAGGACTGGAAGG   2600
806   P   A   R   E   A   A   F   A   S   D   S   L   R   T   G   R   821

2601   TCACGATCATCTCAGAGCATTTGTAAGGCAGGAGAAAGTACAGATGCCCT   2650
822   S   R   S   S   Q   S   I   C   K   A   G   E   S   T   D   A   L   838

2651   CAGCTTGCCTCATGTCAAACTGAAATAAGTTCTTCATTTTCTTTCCAGGC   2700
839   S   L   P   H   V   K   L   K   846

2701   ATAGCAGTTCTTTAGCCATACATATCATTGCATGAACTATTTCGAAAGCC   2750

2751   CTTCTAAAAAGTTGAAATTGCAAGAATCGGGAAGAACATGAAAGGCAGTT   2800

2801   TATAAGCCCGTTACCTTTTAATTGCATGAAAATGCATGTTTAGGGATGGC   2850

2851   TAAAATTCCAAGGTGCATCGACATTAACCCACTCATTTAGTAATGTACCT   2900

2901   TGAGTTAAAAAGCCTGAGAAACCAAACACAGCTAATGCTATGGGGTGTAT   2950

2951   GAATATGTCAAGTTTAGGTCATTTAGAAGATTTGACACTGTATTTTGAAA   3000

3001   TTATGGGAGTAAACACCTTCAAATTTCAGGCATTCTGCTTTGTGACTAA   3050

3051   ATACAAACTACATTTTCAAGATTAGGCCATAATGTATATTTAAACACAAT   3100

3101   GGCTATCAACAGCTGCTAATAAGGTATCAACTAAAGCAGAATTGGGGAAT   3150

3151   AATAGAAATGGCTGCTTATTTCAAGATATATTTGCCAACCCATTCCTATT   3200

3201   CAGTCATTTTTATTATTAATGTAATTTGAATGTCAATTTGTGTGCTTTTGG   3250

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3251  TGATTTAGCGCTGTGGCAAGCAATTTTGCACATCATTTTCATGTTGTTCT   3300

3301  TTATGACAAGAATGTTCTTCAATTAGAAAATGTGCAAATAATGAAATTCA   3350

3351  GGGCCAGTGAGGCAAATAGACTATCTGACATATTTGACTTTATGAAAACA   3400

3401  TATTGCCTGATGGCAGAATCAACTTTATAAGTGGTCAACTTCTACACAAG   3450

3451  CGTATGAAATACTGGTCAGTAGAACAGCCATTGTGATTGGACTGGTTTCT   3500

3501  CTGCAATGGCGCCAACCCCAGGCTTGCCAATACTGCCTATGTAAAGGGCA   3550

3551  AGTGTGAGAAGCTATTCTCATTTCGCTGACATACAGGTAGGACTATGGGG   3600

3601  GATGGGACATTTGAGTGGGACTGAGATAGGAAAGGCTTGAAAAGAACCCA   3650

3651  GAAACACCACCAGGAAGTTGGCAAAGTAAAAGAAAATGACTTCCCCCTCA   3700

3701  AAGGGCAATGAGAGGGAG
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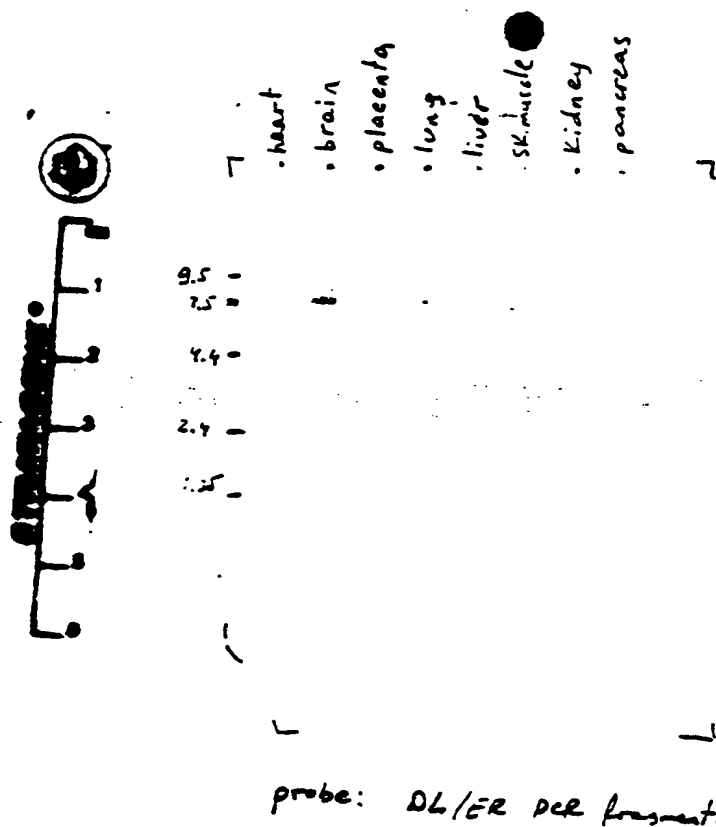
FIGURE 3A

probe: DL/ER PcR fragment.

FIGURE 3B

RT-PCR analysis of the KCN6q gene expression in human tissues

FIGURE 4A

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KCN6q_      .......................................................MS.....LLGKPLS.......
KCNQ4_      MAEAPPRRLGLGPPPGDAPRAELVALTAVQSEQGEAGGGGSPRRLGLLGSPLPPGAPLPG
consensus   maeapprrlgigpppgdapraelvaltavqseqgeaggg SprrlgLLG PL pgaplpg

KCN6q_      YTS.SQS.CR.RN...VK.YRRVQNIIYNVLERPRGWAFIYHAFVFLLVFGCLILSVFST
KCNQ4_      PGSGSGSACGQRSSAABKRYRRLQNIIYNVLERPRGWAFVYHVFIFLLVFSCLILSVLST
consensus   SgS SaC qR saa KrYRRvQNyiYNVLERPRGWAFiYH FvFLLVF CLiLSV ST

KCN6q_      IPEHTKLASSCLLILEFVMIVVFGLEIIIRIWSAGCCCRYRGWQGRLRFARKPFCVIDTI
KCNQ4_      IQEHQELANECLLILEFVHIVVFGLEIIIRIWSAGCCCRYRGWQGRFRFARKPFCVIDPI
consensus   I EH  LA  CLLILEFVMIVVFGLEfIiRiWSAGCCCRYRGWQGR RFARKPFCVID I

KCN6q_      VLIASIAVISAKTQGNIFATSALRSIRFLQILRMVRMDRRGGTWKLLGSVVYAHSKELIT
KCNQ4_      VFIASIAVIAGTQGNIFATSALRSIRFLQILRMVRMDRRGGTWKLLGSVVYAHSKELIT
consensus   V iASiAVv A TQGNIFATSALRSiRFLQILRMVRMDRRGGTWKLLGSVVYAHSKELIT

KCN6q_      AWYIGFLVLIFSSFLVYLVEKDANKFSIYADALWWGTITLTTIGYGDKTPLTWLGRILS
KCNQ4_      AWYIGFLVLIFASFLVYLAEKDANSDFSIYADSLWWGTITLTTIGYGDKTPHTWLGRVLA
consensus   AWYIGFLVLIF SFLVYL EKDAN eFStYAD LWWGTITLTTIGYGDKTP TWLGRiL

KCN6q_      AGFALLGISFFALPAGILGSFALKVQEQHRQKHFEKRRNPAANLIQCVWRSYAADEKS.
KCNQ4_      AGFALLGISFFALPAGILGSFALKVQEQHRQKHFEKRRMPAANLIQAAWRLYSTD.MSR
consensus   AGFALLGISFFALPAGILGSFALKVQEQHRQKHFEKRR PAANLIQ  WR Y  De Sr

KCN6q_      .VSIATWKP...HLK.....ALH.................................TCS
KCNQ4_      AYLTATWYYDSILPSFRELALLFEHVQRARNGGLRPLEVRRAPVPDGAPSRYPPVATCH
consensus   a   ATW  yds L sfrelAL fehvqrarngglrplevrrapvpdgapsryppvaTC

KCN6q_      .P..TKKEQGEASSSQKLSPKERVRMASP.R..GQSIKSRQASVGDRRSPSTHITKEG.S
KCNQ4_      RPGSTSFCPGE..SSRMG.IKDRIRMGSSQRRTGPS.KQQLAPPTMPTSPSSEQVGEATS
consensus   rPgsT    GEasSS   s KeRvRMaS qRrtG SiK    A    SPStd  aBgts

KCN6q_      PTKVQKSWSFNDRTRFRPSLRLKSSQPKPVIDADTALGTDDVYDEKGCQCDVSVIDPTPP
KCNQ4_      PTKVQKSWSFNDRTRFRASLRLK...PK..TSAIDAP.SIRVAFEKSYQCELEVDDMPA
consensus   PTKVQKSWSFNDRTRFR SLRLKssqPkpv  Ad A gtddV dEK  QCDvsVeDi P

KCN6q_      LKTVIRAIRINKFHVAKRKFKETLRPYDVKDVIEQYSAGHLDMLCRIKSLQTRVDQIIGK
KCNQ4_      VKTVIRSIRIIKFLVAKRKFKETLRPYDVKDVIEQYSAGHLDMLGRIKSLQTRVDQIIGK
consensus   lKTVIR IRImKF VAKRKFKETLRPYDVKDVIEQYSAGHLDML RIKSLQTRVDQIIGk

KCN6q_      GQITSDKKSREK...ITABHETTDDISMFGRVVKVEKQVQSIESKLDCLLDIYQQVLRKG
KCNQ4_      G..PGDRKAREKGDKGPSDAEVVDFISMFGRVVKVEKQVQSIEHKLDLLLGFYSRCLRSG
consensus   Gqi  DkK REKgdk   e E DdlSMfGRVVKVEKQVQSIE KLD LL  Y   LR G

KCN6q_      .SASALALSPQIPPFECEQTSDYQSPVDSKDSSGSAQ.NSGCFSRSTSANISRGLQFIL
KCNQ4_      TSAS...LGAVQVPLEDPDITSDYHSPVDHEDISVSAQTLS..ISRSVSTNMD.......
consensus   tSASalaLa  QiP Fe e TSDY SPVD  DlS SAQt SgclSRS S Ni rglqfil

KCN6q_      TPNEFSAQTFYALSPTMHSQATQVPISQSDGSAVAATNTIANQINTAPKPAAPTTLQIPP
KCNQ4_      ............................................................
consensus   tpnefsaqtfyalsptmhsqatqvpisqsdgsavaatntianqintapkpaapttlqipp

KCN6q_      PLPAIKHLPRPETLHPNPAGLQESISDVTTCLVASKENVQVAQSNLTKDRSMRKSFDMGG
KCNQ4_      ............................................................
consensus   plpaikhlprpetlhpnpaglqesisdvttclvaskenvqvaqsnltkdrsmrksfdmgg

KCN6q_      ETLLSVCPMVPKDLGKSLSVQNLIRSTEELNIQLSGSESSASRGSQDFYPKWRESKLFIT
KCNQ4_      ............................................................
consensus   etllsvcpmvpkdlgkslsvqnlirsteelniqlsgsessasrgsqdfypkwresklfit

KCN6q_      DEEVGPEETETDTFDAAPQPAREAAFASDSLRTGRSRSSQSICKAGESTDALSLPHVKLK
KCNQ4_      ............................................................
consensus   deevgpeetetdtfdaapqpareaafasdslrtgrsrssqsickagestdalslphvklk
```
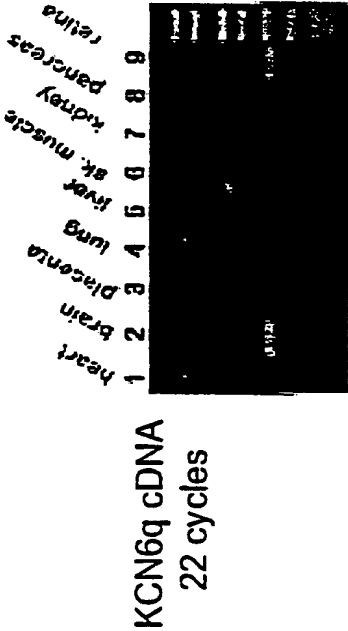
FIGURE 4B


```
KCN6q_        ..........MXEAPPRRLG....LGPPPGD....APRAELVALTAVQSE................QGEAGG
KCNQ4_        MVQKSR....NGGVYPG......PSGEKKLKVG....FVGLDPGAPDSTRDGALLI
KCNQ2_        MELKARRAAGAAGGDGGGGGGGAANPAGGDAAAAGDEERKVGLAPG..DVEQVTLALG
KCNQ3_
KCNQ1_
consensus     ma k rr  gaag  gg   pg gggaa pag   al ag   er vgl pgapd     g alg

KCN6q_        ..MS....LLGKPLS..................YTS......SQS.CR.RN...VK.YRRXQNX
KCNQ4_        GGSPRRLGLLGSPLPPGX.PLPG.....PGSG....SGSACGQRSSAAHKRYRRLQNXX
KCNQ2_        AGS..EAPKRGSILSKP..RAGG....AGAG...K.....PPKRN...AF.YRKLQN
KCNQ3_        AG.....ADKDGXLLLEGGGRDEGQRRTPQGIGLLAKTPLSRPVKRNN..AK.YRRXQTLX
KCNQ1_        ..........................................METRGS...RLTGGQGRX
consensus     agspr a  lgspls gagr  gqrrtp gsgllakts s     kRnsaaakryrrlQnyl

KCN6q_        YNVLERPRGWA.FXYHAFVFLLVFGCLILSVPSTIPEHTKLAXSCLLILEPVMIVVFGLE
KCNQ4_        YNVLERPRGWA.FXYHVFXFLLVFSCLVLSVLSTIQEHQELANECLLILEPVMIVVFGLE
KCNQ2_        YNVLERPRGWA.FXYHAXVFLLVFSCLVLSVFSTIKEYEKSSEGALYILEIVTIVVFGLE
KCNQ3_        YDALERPRGWA.LXYHALVFLXVLGCLILAVLXTFKEYETVSGDWLLXLETFAIFXFGAE
KCNQ1_        YNPLERPTGWKCFXYHPAVFLXVLVCLIFSVLSTIEQYAALAXGTLFWMEIVXVPFGTE
consensus     YnvLERPrGWacfiYHafvFLlVf CLilsVlsTikeyeklasgcLliLE vmivvPGlE

KCN6q_        XIXRIWSAGCCCRYRGWQGRLRFARKPFCVIDTIVLIASXAVXSAKXQGNXFATSALRSL
KCNQ4_        YIVRXWSAGCCCRYRGWQGRFRFARKPFCVIDPIVPXASXAVXAAGXQGNXFATSALRSX
KCNQ2_        YFVRIWAAGCCCRYRGWRGRLXFARKPFCVIDIXVLIASXAVXAAGXQGNVFATSALRSX
KCNQ3_        XAXRIWAAGCCCRYXGWRGRLXFARKPLCXEDIFVLIASXPVXAVGNQGNVLATS.LRSL
KCNQ1_        YXVRXWSAGCRSXYVGLWGRLRFARKPISXIDXIVXXASXVVXCVGXKGXVFATSAXRGX
consensus     yivRiWsAGCccrYrGw GRlrFARKPfcviDiiVliASiaVvaagtqGnvfATSalRsl

KCN6q_        RFLQILRMXRMDRRGGTWKLLGSVVYAHSKELITAWYIGFLVLIFSSFLVYLXEKD....
KCNQ4_        RFLQILRMXRMDRRGGTWKLLGSVVYAHSKELITAWYIGFLVLIFXSFLVYLAEKD....
KCNQ2_        RFLQILRMXRMDRRGGTWKLLGSVVYAHSKELXTAWYIGFLCLILXSFLVYLAEK.....
KCNQ3_        RFLQILRMXRMDRRGGTWKLLGSAXCAHSKELITAWYIGFLTLILXSFLVYLVEKDVPEV
KCNQ1_        RFLQILRMXHVDRQGGTWKLLGSVVXIHRQELITTLYIGFLGLIFSSXFVYLAEKDAVN.
consensus     RFLQILRMvrmDRrGGTWkLLGSvvyaHskELiTawYIGFLvLIfssflVYLaEKd    v

KCN6q_        .......ANKEFSTYADALWWGTITLTTIGYGDKTPLTWLGRLLSAGFALXGISFFALPAG
KCNQ4_        .......ANSDFSEYADSLWWGTITLTTIGYGDKTPHTWLGRXLAAGFALXGISFFALPAG
KCNQ2_        ...GE..NDHFDTYADALWWGXITLTTIGYGDKTPHTWLCRXLAAGFALXGISFFALPAG
KCNQ3_        DAQGEXMKXEFETYADALWWGXITLAXTIGYGDKYPQTWNGRLLAATFXLXGXSFFALPAG
KCNQ1_        ....XSGRVEFGSYADALWWGXTXTTTIGYGDKVPQTWXGXTIASCFXXFAXSFFALPAG
consensus     daqge  andeFstYADaLWWGliTlTtIGYGDKtPqtWlGrllaa Ftllgisffalpag

KCN6q_        ILGSGFALKVQEQHRQKHFEKRRNPAANLIQCVWRSYAAXEKS..VSIATWKP.....HL
KCNQ4_        ILGSGFALKVQEQHRQKHFEKRRMPAANLIQAAWRLYSTD.MSRAYLTATWYYX..SIL
KCNQ2_        ILGSGFALKVQEQHRQKHFEKRRNPAAGLIQSAWRXYATD.MSRTDLHSTWQYYERTVX
KCNQ3_        ILGSGXALKVQEQHRQKHFEKRRXPAAELIQAAWRXYATN.PNRIDLVATWRXYESVVXX
KCNQ1_        ILGSGFALKVQQKQRQKHFNXQIPAAASLIQTAWRCYAAXNPD....SSTWKIX
consensus     ILGSGfALKVQeqhRQKHFekrrnpAAnLIQaaWRfYatd psr dl aTWkyye   vtl

KCN6q_        K.........ALH
KCNQ4_        PSFREX....ALLPEHVQRARNGGLRPLEVRRAPVPDGAPSRYPPVATCXXPGX....TCS.P....TKKE
KCNQ2_        PMXRLXPPLNQLELLRN.........................................TSPC
KCNQ3_        PPFRKE....QLEAA.................................LKSXSGLAFRKDP
KCNQ1_        ..IRKAPRSHTLLSP.........................................S.........
consensus     p frklp    L     qrarngglrplevrrapvpdgapsryppvatcsrpg aftk

KCN6q_        QGEASSSQKLSPKSRVRMASP.R...GQSIKSRQASVGDRRSPSTDIXAXG.SPXKVQKSW
KCNQ4_        PGE...SSRMG.XKDRXRMGSSQRRTGPX.KQQLAXPTMXTSPSXEQVGEATSPXKVQKSW
KCNQ2_        PPEPSPSQKVSLKDRVPSS.P.RGVXAKGKGSPQAQTVRRSPSADQXLED.SPXKVPKSW
KCNQ3_        .....SOKLGLLDRVRXSNX.RGSNTKGKXPT.........PLNVDAIXX.SPXKEPKPV
KCNQ1_        .PKXKKSVVXKKKKFKLDKDN..GVTXGEKMLXVX......HITCDPPEX..RRLDHFSV
consensus     p epsssqklslkdrvrmsspqrgvgp gKl tap tmrrspstd t Eetsptkv ksw

KCN6q_        SFNDRXRFRPSLRLKSSQXKPVIDAXTXLG.TDDVIDEKGCQCDVSXEDLTPPLKTVIRA
KCNQ4_        SFNDRXRFRASLRLK...PR..TSXEDAP..SEXVAXEKSYQCELXVXDXMPXKTVIRS
KCNQ2_        SFGDRXRARQAFRIKXAASR..QNSEXASLPGXDXVDDKSCPCXFVTEDLTPXLKVSIRA
KCNQ3_        GLNNKXRFRXAFRMKXAYAPW..QSSEDAGT.GXPMAXDRGYGNXPXIEDMIPTXKAAIRA
KCNQ1_        DGYDXSXVRKSPTLLEVSMXHFMRTNSFAED..LDXEGXTLLTPITHXSQXREHHRATIXV
consensus     sfndrtrfrt  rlkgsapr vqs edA  pgddvadek  qcdfsvedltpalk vIra
```

FIGURE 4C

```
KCN6q_    IRIM FE VAKRKFKETLRPYDVKDVIEQYSAGHLDML RIKSLQTRVDQI GGQ. ITSD
KCNQ4_    IRI  FLVAKRKFKETLRPYDVKDVIEQYSAGHLDML RIKSLQTRVDQIVG G...PGD
KCNQ2_    VC M  FLVS KRKFKE LRPYDVMDVIEQYSAGHLDMLS RIKSLQ RVDQIVG GPA TDK
KCNQ3_    YRI  FR Y K KFKETLRPYDVKDVIEQYSAGHLDMLSRIKSLQ RVDQIVG GPA TDK
KCNQ1_    IRRM  F VAK KFQQAR PYDV DVIEQYS GHLN  VRIKE LQRR D  FTPGEPS PK
consensus irimkflvaKrKPketlrPYDVkDVIEQYSaGHLdmlsRIKsLQtRvDqivgkgp it

KCN6q_    KKSREK............. ITAEHETTD..... D SM GR VKVEKQVQS ESKLDCL
KCNQ4_    KARE KGDK............ GPSDAEVVD..... SMMGR VKVEKQVQS EHKLDLL
KCNQ2_    D..RTKG.............PAEAELP.... EDPSMMGR CKVEKQVLSMEKKLDPL
KCNQ3_    HKKSQKGSAFTFPSQQSPRNEPYVAR.PSTSEIEDQSMHGKFVKVE QVQDMGKKLDPL
KCNQ1_    ISVSEK..............SKDR.GSN.... GAR NRVEDKVTQIDQRLALIT
consensus kk reKg  ftfpsqqsprn p eaevp  seiedlsmmgrvvkVEkqVqsiekkLd ll

KCN6q_    D YQQ LRKG. SASALALA FQ PPFECEQTSDYQSPVDSK...DLSGSAQ. NSGC SRS
KCNQ4_    GFYSRCLRSGTSAS...LGAVQVPLPDPUITSDYHSPVDHE...D SVSAQTLS..ISRS
KCNQ2_    N YMQRMG...IPPTETEXV..FC KEPE PAPPYHSPEDSREHYDRHGCIV....KIVRS
KCNQ3_    D HMQHMER..LQVQ TEYVPTKGTSSPAEAE...KKEDNE YSDLK........T ICN
KCNQ1_    D LHQ LSLHGGS PGSGP PREG AHIT QPCGSGGSVDPELE PSNTLPTYEQL YPRR
consensus diymqvlrkg sas lt aypqigafepeq sdyhspvDsk yvdlsgsaq  s tisrs

KCN6q_    TSANISRGLQ ILTPNEFSAQTFYAL PTMHSQATQVPISQSDGSAVAATNTIAMQINTA
KCNQ4_    VSTNMD..................................................
KCNQ2_    SSTGQK...NFSAPPAA........PPVQCPPST....SWQ......PQSHPRQGHGTS
KCNQ3_    YSETG.........PPE.........PPYSFHQVTIDKVSPYGFFAHDPVNLPR.G.GPS
KCNQ1_    GPDEGS.................................................
consensus ts  gsrglq     ppe  saqtfyalpp     q t   is     a p n prng gts

KCN6q_    PKPAAPT LQIPPPLPAIKH PRPE LHPNPAGLQESISDVTTCLVASKENVQVAQSNLT
KCNQ4_    ....................................................
KCNQ2_    PV GDHGS VRIPPPPAH...ER..SLSAYGRGN...........RASMEPI..RQEDTP
KCNQ3_    .....SGKVQATPPSSATTYVEREVPILTLLDS...........RVSCHS....QADLQ
KCNQ1_    ....................................................
consensus p pa  gtlq pp pa   lerp tl    ag  esisdvttclras e vqv q dl

KCN6q_    KDRSMRKSFDMGGETLLSVCPMVPKDLGKSL.SVQNLIRSTEELNIQLSGSESSASRGSQ
KCNQ4_    ....................................................
KCNQ2_    G......CRPPEGTLR....D..SDTSISPSVD.....HEELERSPSGFSISQSL NL
KCNQ3_    GPYSDRISPRQRRSITR....D..SDTPLSLMSVN.....HEELERSPSGFSISQDR ..
KCNQ1_    ....................................................
consensus g  s rs r   tlrsvcpdvpsdt isl svqnlirsheelers sgfsisqsre

KCN6q_    D YPKWRESKLE TDEEVGPEETETDTPDAAPQP.......AREA PASDS RTGRS SS
KCNQ4_    ....................................................
KCNQ2_    DALNSCY  AVAPCAKVRPY AEGESDTDSDLCTPCGPPRSATGEGPPFGDVGWAGPRK..
KCNQ3_    D YFGPNQGSSWMRKR.YLAEGETDTDTDPFTPSGSMPLSSTGDG.ISDSVWTPSNKPI
KCNQ1_    ....................................................
consensus dfl   aa  fi d r yiaegetdtdsd tp g p satgeg  sdslwtg  k

KCN6q_    QSICKAGESTDALSLPHVKLK
KCNQ4_    ....................
KCNQ2_    ....................
KCNQ3_    ....................
KCNQ1_    ....................
consensus qsickagestdalslphvklk
```